Manufacturers Record

Reg. U. S. Patent Office

AUGUST, 1936 BALTIMORE, MD.

SOUTHERN RAILROADS SPEND $1,100,000,000

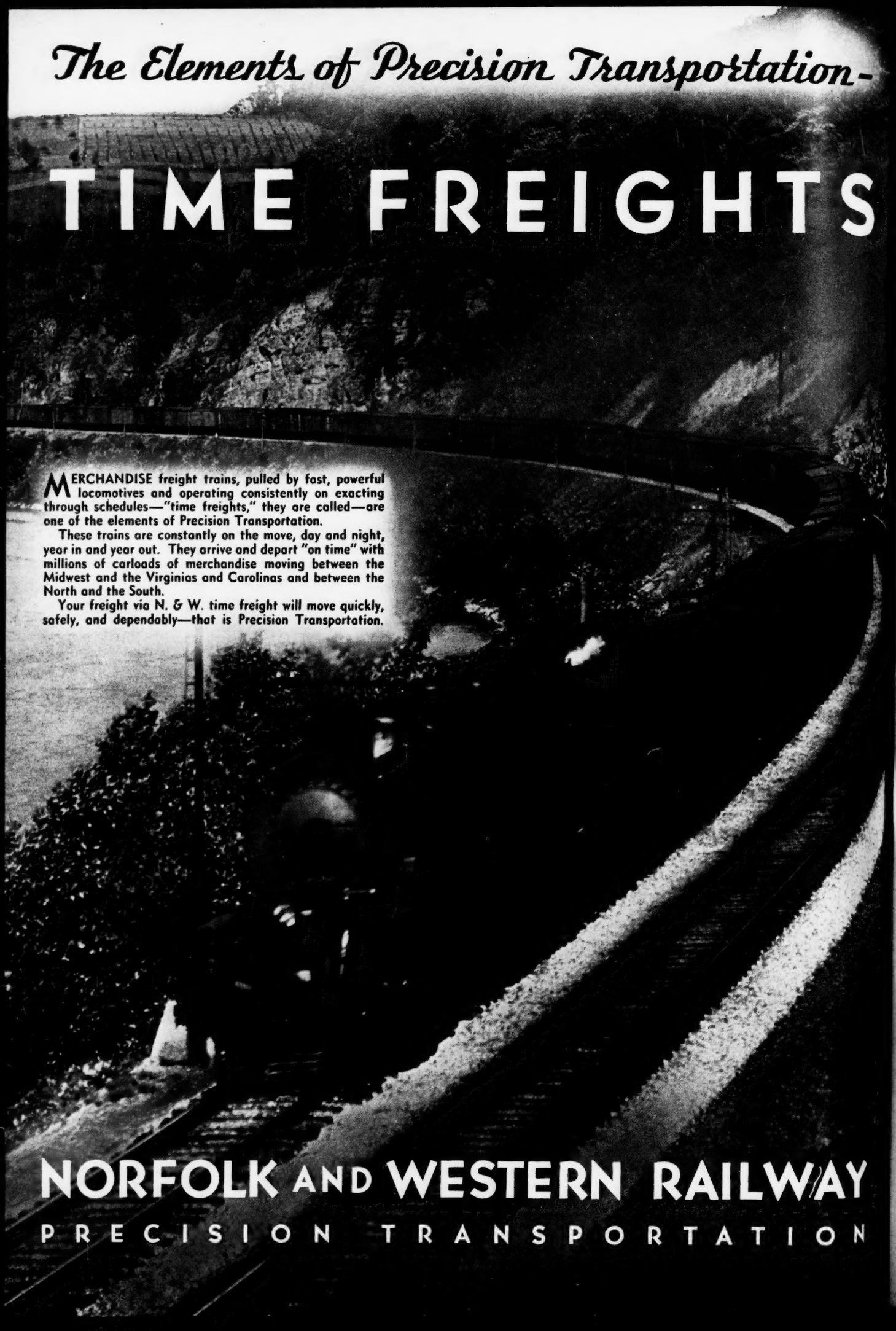
More than $1,100,000,000 is being spent by the railroads of the South for betterments, upkeep and operation in 1936. Their buying power of more than $500,000,000 and their expenditures for wages and salaries of nearly $600,000,000 indicate, even in the smaller volume of traffic handled this year compared with boom times, the importance of the railroads in the economic life of the nation.

EXPENDITURES ITEMIZED FOR 1936

Estimated gross capital expenditures for additions and betterments		$75,000,000
Outlay for equipment	*$35,000,000*	
For roadway and structural materials	*40,000,000*	
Estimated Expenditures for maintenance		$453,000,000
Principal items purchased:		
Coal and other fuel	*$61,400,000*	
Ties and other forest products	*20,000,000*	
Iron and steel products	*50,000,000*	
Miscellaneous	*41,000,000*	
Total Capital and Maintenance expenditures		$528,000,000
Wages and salaries paid		$580,000,000

These figures do not take into consideration the amount spent for taxes of approximately $60,000,000, interest on borrowed money or dividend payments.

In the September MANUFACTURERS RECORD will be published a comprehensive article analyzing the expenditures of the railroads of the South and showing the extent of their disbursements that reach into practically every industry and trade of the United States.


The Elements of Precision Transportation-
TIME FREIGHTS
MERCHANDISE freight trains, pulled by fast, powerful locomotives and operating consistently on exacting through schedules—"time freights," they are called—are one of the elements of Precision Transportation.
These trains are constantly on the move, day and night, year in and year out. They arrive and depart "on time" with millions of carloads of merchandise moving between the Midwest and the Virginias and Carolinas and between the North and the South.
Your freight via N. & W. time freight will move quickly, safely, and dependably—that is Precision Transportation.
NORFOLK AND WESTERN RAILWAY
PRECISION TRANSPORTATION

Entered as second-class matter at the postoffice, Baltimore, Md., under the act of March 3, 1879. Volume CV, No. 8 Monthly

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AUGUST 1936

Volume CV No. 8

MANUFACTURERS RECORD

Devoted to the Upbuilding of the Nation Through the Development of the South and Southwest as the Nation's Greatest Material Asset

Published Monthly

by the

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Frank Gould, President

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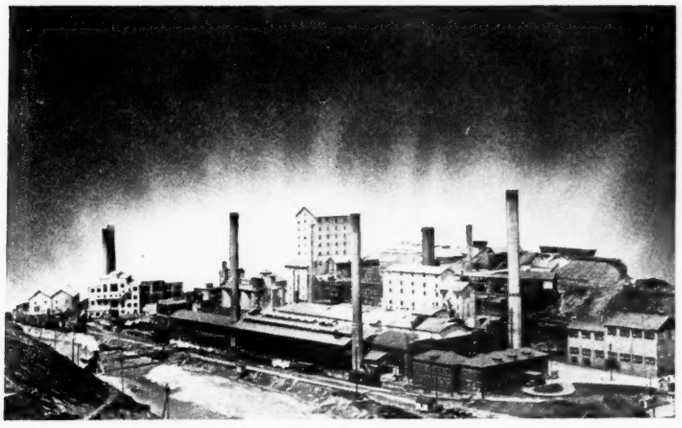
Subscribers are asked to notify us of change in address to avoid delay in service.

PUBLISHERS DAILY CONSTRUCTION BULLETIN AND BLUE BOOK OF SOUTHERN PROGRESS

Member A.B.C.

AUGUST NINETEEN THIRTY-SIX



One of the South's Chemical Industries

EDITORIALS

NEWS and FEATURE ARTICLES

SPECIAL DEPARTMENTS

CONCRETE BUILDINGS
SERVE BETTER AT LOWER COST

Cashman Laundry, built in architectural concrete. The Bronx, New York City. Russell G. and Walter M. Cory, architects and engineers. Turner Construction Co., builders

Recent Architectural Concrete Commercial Buildings Include—

- Bank buildings
- Employe recreation building
- Home office, large marketing organization
- Chemical laboratory
- Printing ink plants
- Bottling works
- Produce markets
- Printing and engraving plant
- Food factory
- Plant unit, machinery manufacturer

Architectural Concrete

Frame and floors cast integral with walls and ornamental detail . . . Weather-resistant . . . Firesafe . . . Distinctive . . . Economical.

IF you want people to admire your building . . . if you want it to be firesafe and disaster-proof . . . moderate in cost and amazingly low in upkeep . . . build with concrete!

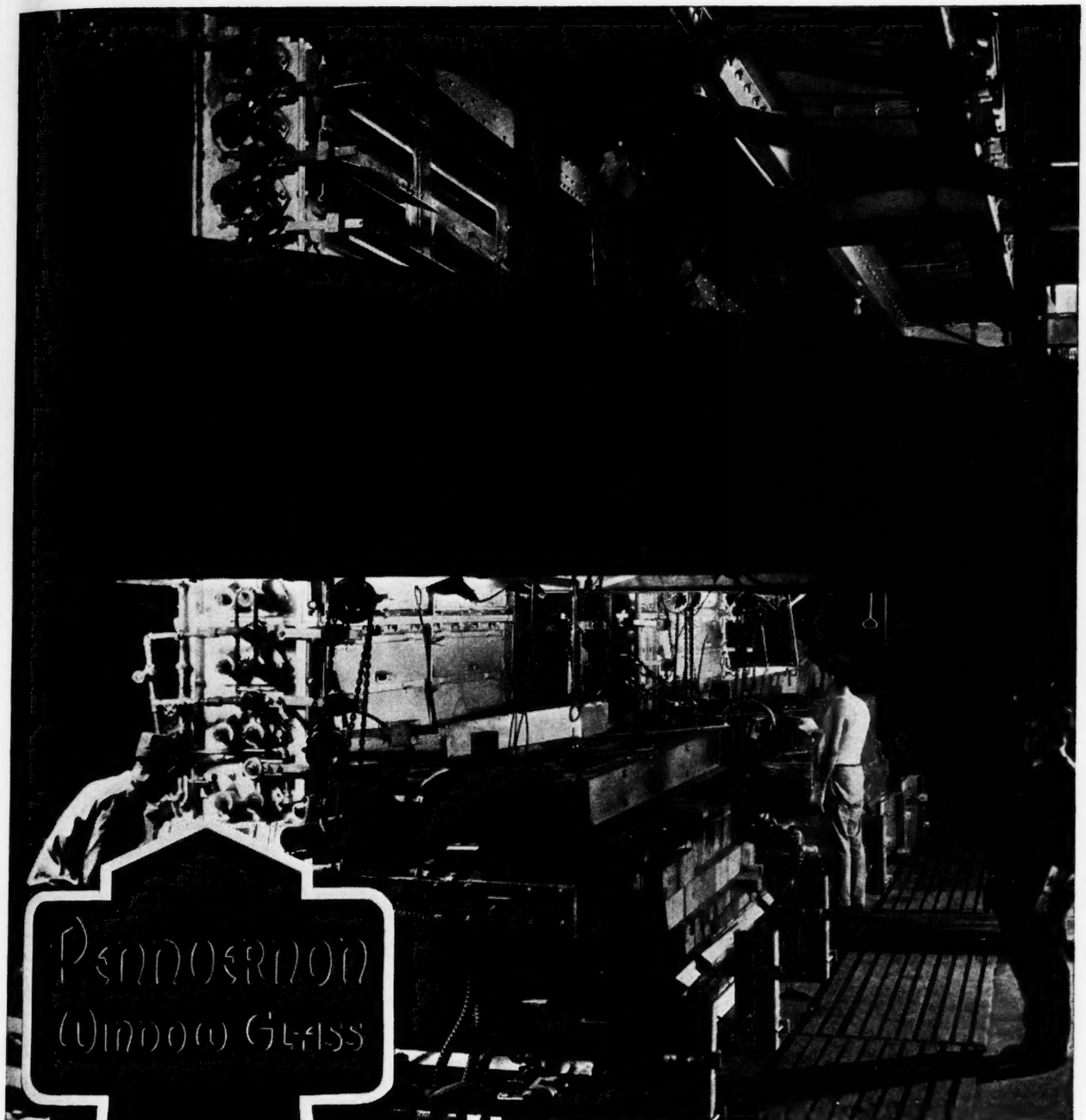
By proved technique, the frame, floors, walls and ornament of modern buildings are cast as concrete monoliths of great strength and rigidity. Architectural concrete is being used all over the country to give distinction to factories, shops and office buildings, to schools, churches and public structures of all kinds.

Enlist the benefits of this modern building method for your business. Ask your architect and engineer about architectural concrete. Or write for one of our engineers to call.

Let us send the attractively illustrated booklet, *Beauty in Walls of Architectural Concrete.*

PORTLAND CEMENT ASSOCIATION
Dept. A8-21, 33 W. Grand Ave., Chicago, Ill.

Use "Pennvernon"...not just "window glass"



Photograph by Johnston & Johnston

UP FROM THE DEPTHS of the melting tank below, this specially-designed Pennvernon drawing machine draws the molten glass, forms it into the brilliant, clear sheets which have made the name "Pennvernon" synonymous with high quality. Skilful Pennvernon Craftsmen tend the machine carefully and faithfully, day and night.

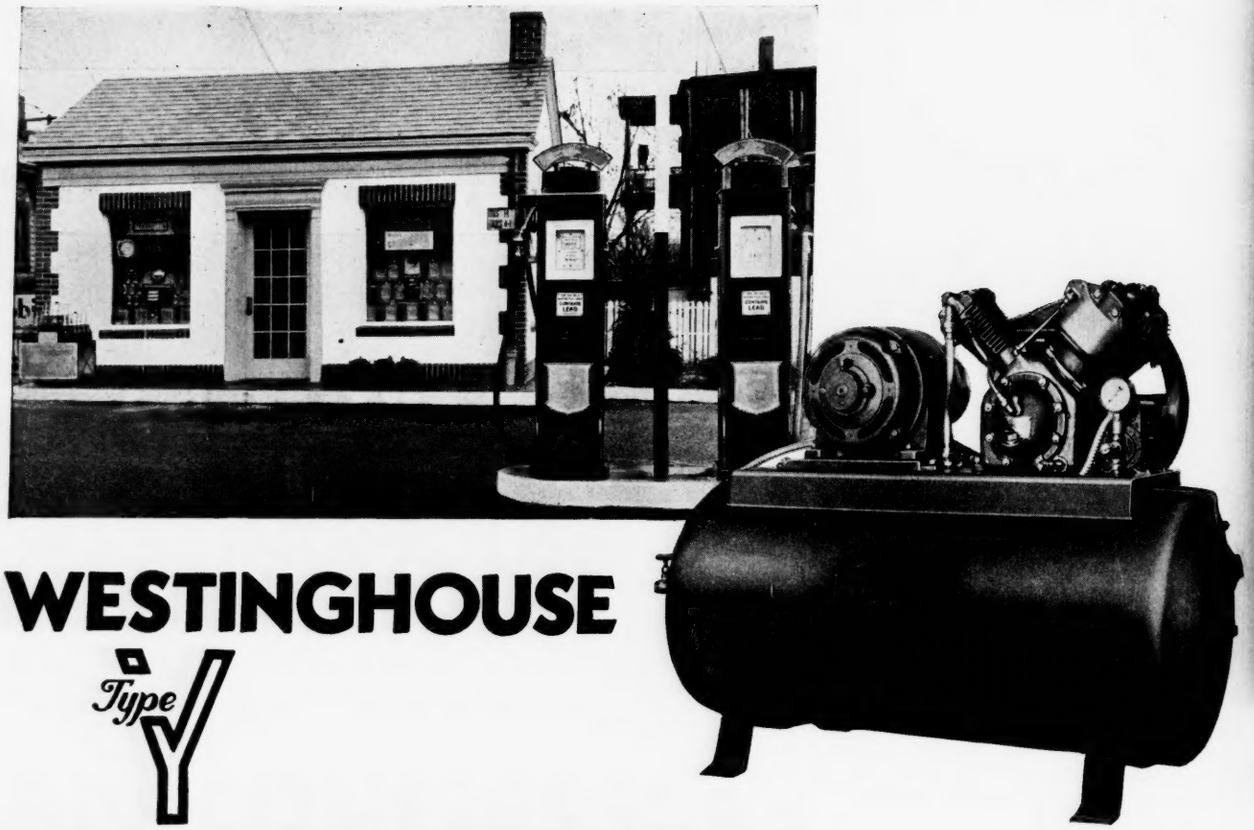
Our new booklet, called "The Making of a Leader", describes in dramatic pictures the manufacture of Pennvernon Window Glass. To get your free copy of this interesting book, sign and mail this coupon to

PITTSBURGH
PLATE GLASS COMPANY
2264B Grant Building, Pittsburgh, Pa.

Name_____

Address_____

City_____ State_____

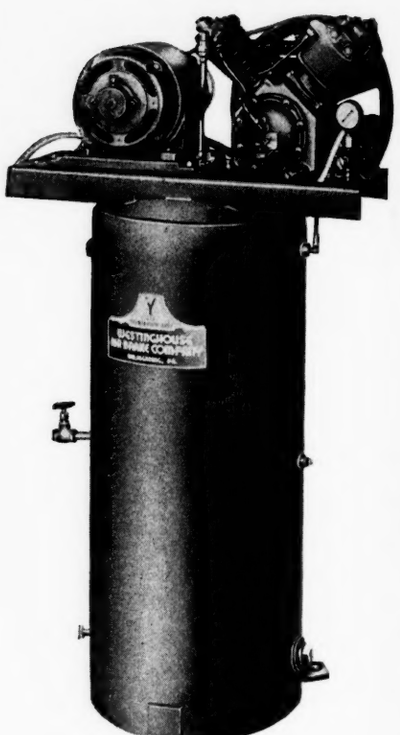


WESTINGHOUSE

Type Y

AIR COMPRESSORS

For ...Garage and Service Station



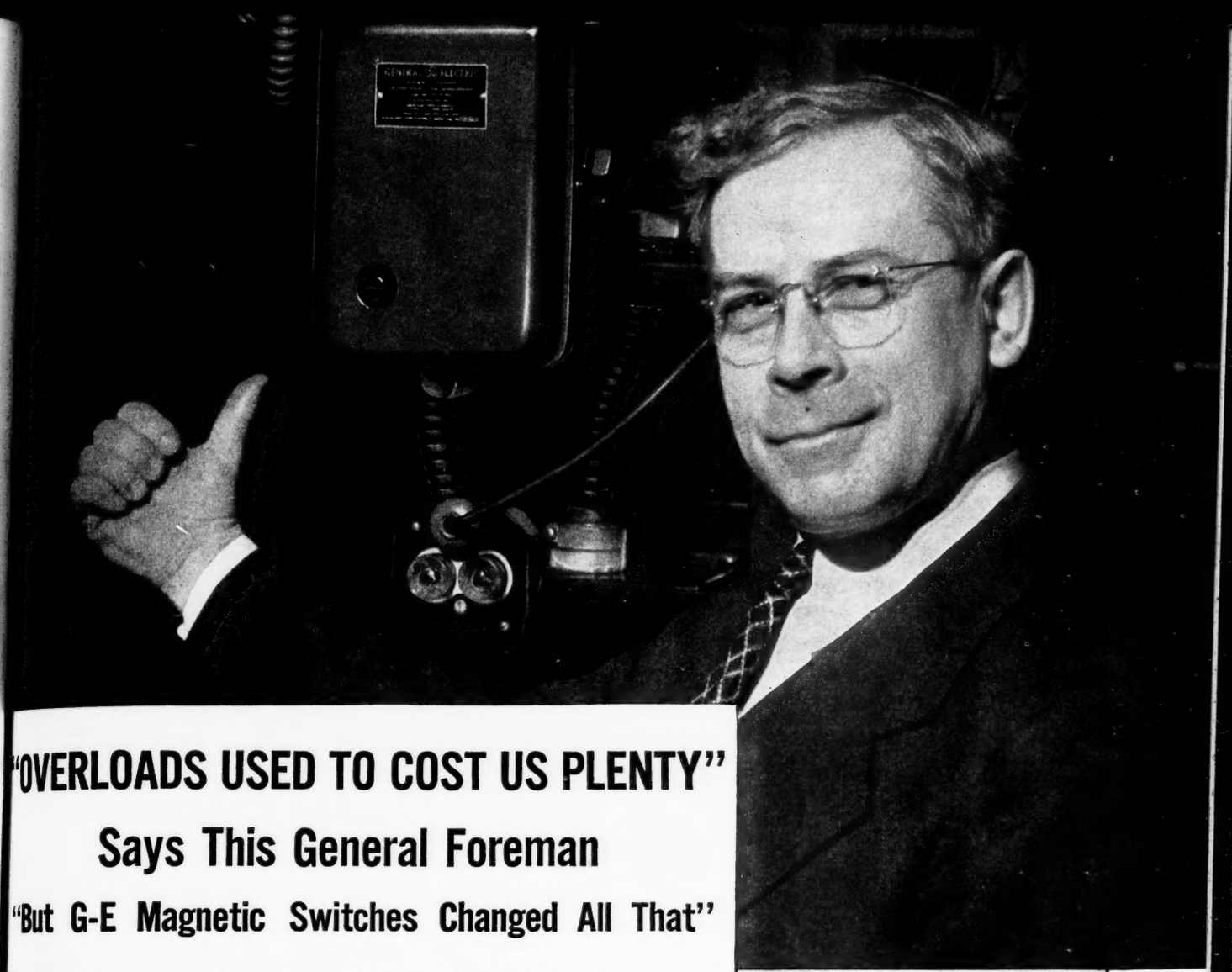
The "Y" Type Air Compressors are air-cooled for continuous operation at 200 lbs. pressure . . . two-stage, sizes from 4 to 45 cu. ft. . . . controlled combined pressure and splash lubrication . . . unloading feature interlocked with lubricating system to prevent delivery of air when oil supply is depleted . . . vertical or horizontal units as conditions require . . . efficient, reliable, and economical for the modern service station or garage.

Ask for Special Publication 9084

WESTINGHOUSE AIR BRAKE CO.

Industrial Division

PITTSBURGH • PENNSYLVANIA



"OVERLOADS USED TO COST US PLENTY"

Says This General Foreman

"But G-E Magnetic Switches Changed All That"

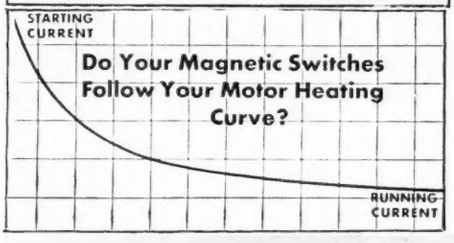
"IT took us quite a while to realize how much harmless overloads were costing us," this general foreman tells us. "Our old magnetic switches would throw our motors off the line every time an overload occurred—even if the overload was of short duration, and harmless. These shut-downs meant temporary holdups in production, and they wasted the time of our operators. Maybe they didn't cost us much in any single case, but in a year's time they added up to plenty."

G-E magnetic switches can give you, too, this outstanding protection because they are designed to follow closely the heating characteristics of your motors. Not only will they guard your motors against harmful overloads, but they will also permit the motors to continue in operation during harmless overloads.

In addition to this money-saving advantage, there are many other features of our new switches that you will like. For instance, they are very easy to install. There is ample room inside the case for wiring, and the terminals are conveniently located. And you have only to lift out the arc chute to inspect the tips. Why not plan to replace your old switches with this modern control? Our specialists will be glad to work with you at any time. General Electric, Schenectady, New York.

GENERAL ELECTRIC

FULL PROTECTION ALL THE WAY WITH G-E MAGNETIC SWITCHES



General Electric Company
Dept. 6—201, Schenectady, N. Y.

I should like to know more about G-E magnetic switches. Please send me your Bulletin GEA-841E.

Name.....

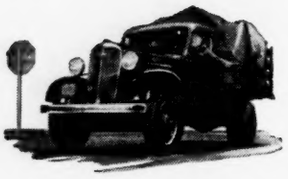
Company.....

Address.....

080-62

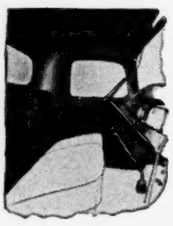
"I am Saving Hundreds of Dollars Every Year," says Chevrolet Truck Fleet Owner

CHEVROLET
FOR ECONOMICAL TRANSPORTATION



NEW PERFECTED HYDRAULIC BRAKES
always equalized for quick, unswerving, "straight line" stops

NEW FULL-TRIMMED DE LUXE CAB



with clear-vision instrument panel for safe control

SOUTHERN BREWING COMPANY, Houston, Texas, is another truck fleet owner that has learned by experience and comparison of the outstanding advantages and economy offered by Chevrolet trucks. Mr. Carl R. Allen, who has personal supervision of this company's truck equipment, says:

"Approximately 1,000,000 miles of hauling (7,000 pounds per unit on 5 trucks) has convinced me that I am saving hundreds of dollars each year by standardizing on Chevrolet after trying competitive makes on the same hauls, over the same roads.

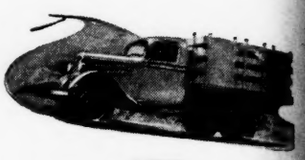
"Chevrolet truck No. 4 completed 110,000 miles of service with only one valve grind job and no other mechanical work except minor adjustments.

"Chevrolet truck No. 3—80,000 miles—with an expenditure of $25.00 for parts and service.

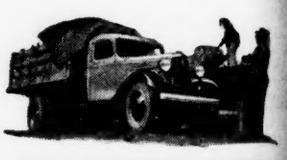
"I am averaging 12.6 miles per gallon of gas; changing oil every 1,000 miles—and I have never added a quart between drains."

Join the hundreds of fleet owners who are gaining similar results from their Chevrolet trucks—the *world's thriftiest high-powered trucks!* See or phone your Chevrolet dealer for the demonstration that will convince you that *low-priced* Chevrolet trucks lead in power, economy and dependability.

CHEVROLET MOTOR COMPANY, DETROIT, MICHIGAN



NEW HIGH-COMPRESSION VALVE-IN-HEAD ENGINE
with increased horsepower, increased torque, greater economy in gas and oil



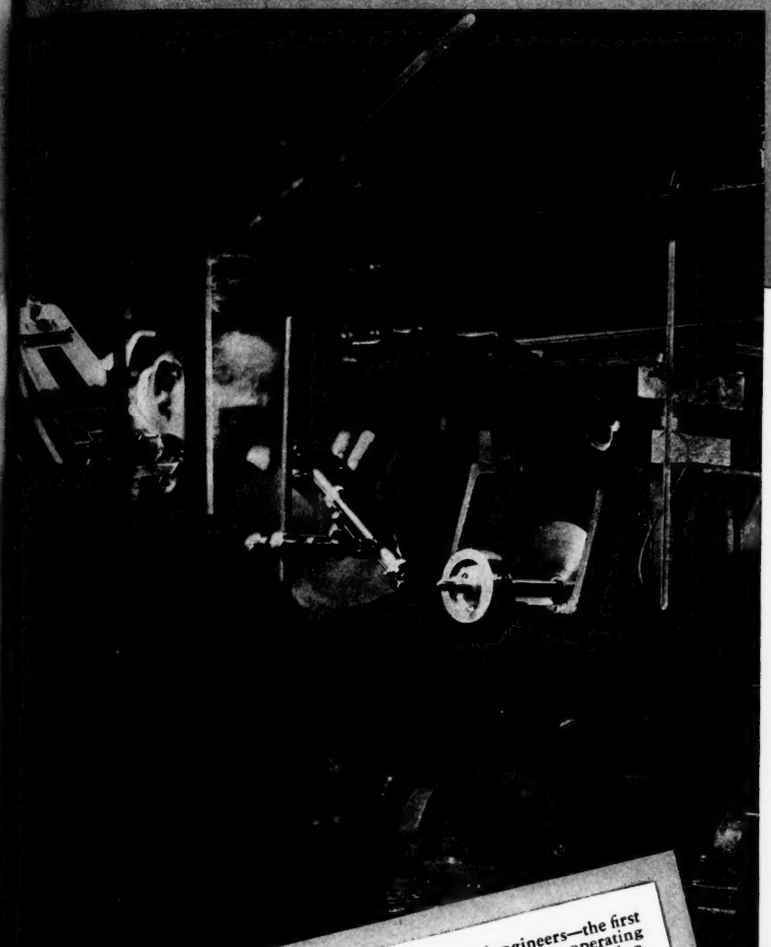
FULL-FLOATING REAR AXLE
with barrel type wheel bearings on 1½-ton models

GENERAL MOTORS INSTALLMENT PLAN—MONTHLY PAYMENTS TO SUIT YOUR PURSE

CHEVROLET TRUCKS

Behind the Quality of GULF LUBRICANTS

is the world's most modern petroleum research laboratory



(*Above*) A new machine developed by Gulf engineers—the first that will test any type of bearing under precisely the operating conditions of actual service. It measures accurately friction, torque, temperature, wear and film thickness.

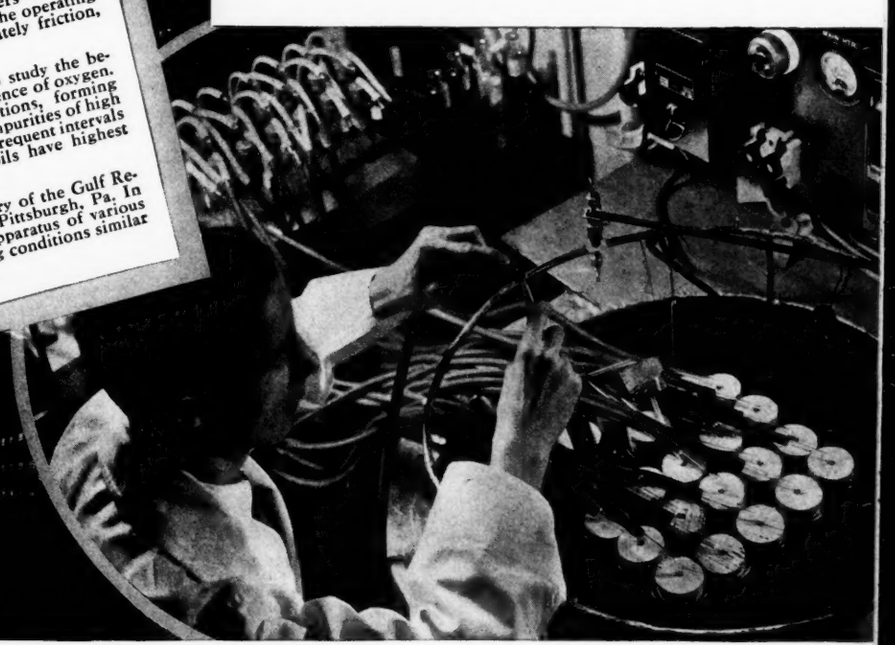
(*Right*) This complicated apparatus is used to study the behavior of oils at high temperatures in the presence of oxygen. Oils deteriorate rapidly under these conditions, forming organic acids, insoluble sludges and soluble impurities of high viscosity. Samples of the oil are withdrawn at frequent intervals for test, and the changes measured. Gulf oils have highest resistance to such deterioration.

(*Below*) A night view of the new laboratory of the Gulf Research & Development Corporation near Pittsburgh, Pa. In this laboratory are many machines and apparatus of various types which test lubricants under operating conditions similar to those encountered in actual service.

WHAT is the rate of oxidation of an oil? What chemical changes take place in an oil under severe service? What is the best oil for a particular type of bearing?

Gulf scientists are finding the answers to these and thousands of other questions regarding lubricants in Gulf's modern research laboratory shown below. Many types of experimental machines duplicate the conditions under which oils perform in actual service.

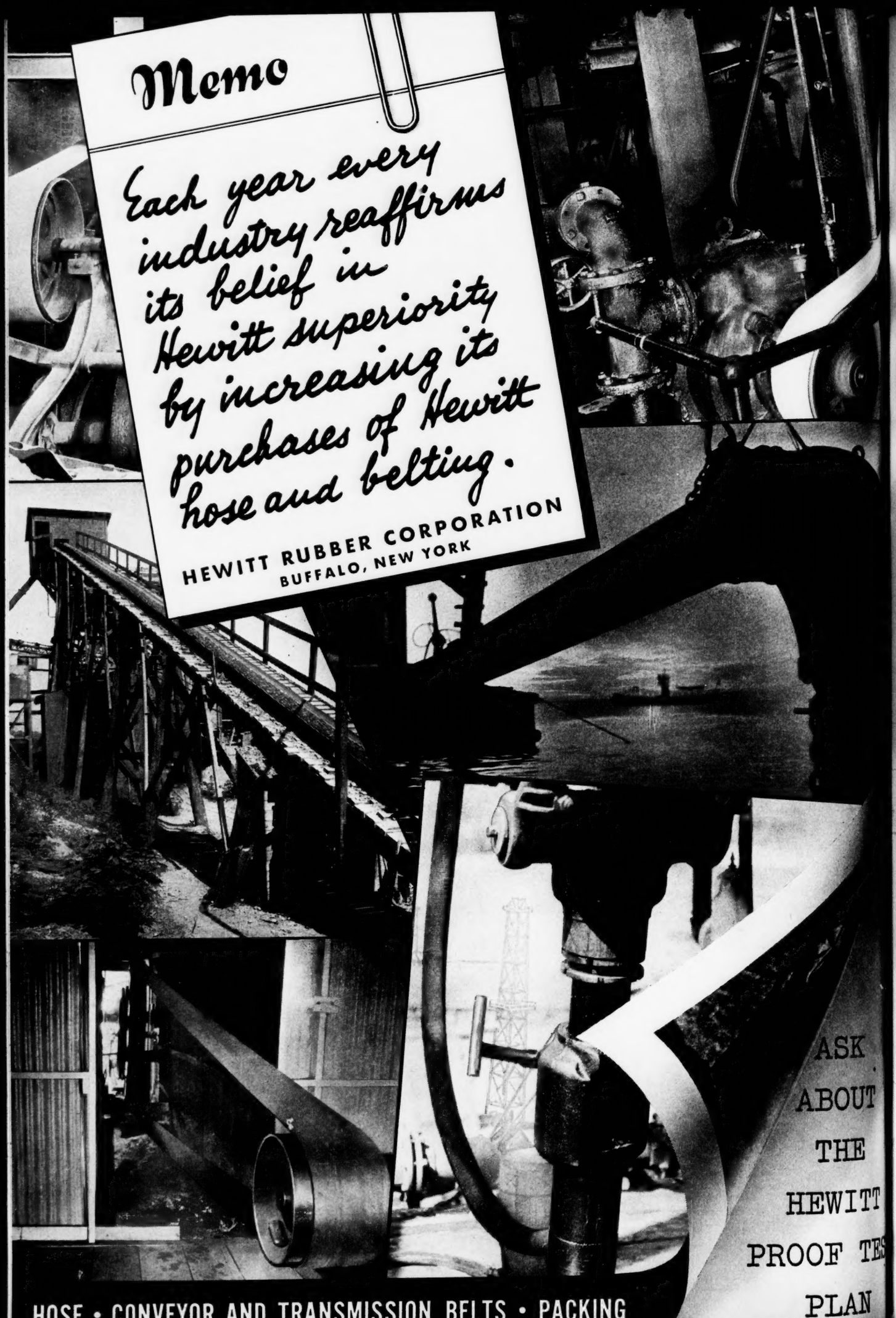
Thus, the knowledge gained by many years of practical experience in thousands of industrial plants throughout 28 states in lubricating machinery of every type can be supplemented with newly discovered facts. And the user of Gulf lubricants is assured that *when science develops improved petroleum products* they will be available to him.



GULF INDUSTRIAL LUBRICATION

GULF OIL CORPORATION—GULF REFINING COMPANY

GENERAL OFFICES: GULF BLDG., PITTSBURGH, PA.


Memo
Each year every industry reaffirms its belief in Hewitt superiority by increasing its purchases of Hewitt hose and belting.
HEWITT RUBBER CORPORATION
BUFFALO, NEW YORK
ASK ABOUT THE HEWITT PROOF TES PLAN
HOSE • CONVEYOR AND TRANSMISSION BELTS • PACKING

As you fly over New York, or look down from the Empire State or Chrysler Towers, draw an imaginary circle around the area from 20th Street to 90th Street, East River to North River. Then consider the amazing fact that the Empire State and Chrysler Buildings . . . all the buildings of the Rockefeller Center Group . . . the Pennsylvania and New York Central railroad terminals . . . Waldorf-Astoria, Commodore and other hotels . . . Mayflower, Hollywood and other theatres . . . Bonwit Teller's, Lord and Taylor's, Bloomingdale's and other department stores . . . the Tudor City buildings . . . *all these* and literally hundreds of other buildings in this area are heated—and in many cases cooled—during the major part of the year with steam from the Kips Bay Station of the New York Steam Corporation.

On one of last winter's coldest days, Kips Bay, the largest central heating plant in the world, sent 46 million pounds of live steam hurtling through its underground distribution system at a speed of 180 miles an hour as its share in maintaining in comfortable warmth the occupants of 1,500,000,000 cubic feet of midtown building space. One of the five boilers in the Kips Bay plant has averaged 805,000 pounds of steam per hour, twenty-four hours a day, for a full month—more steam than any other boiler in the world has produced in a comparable period.

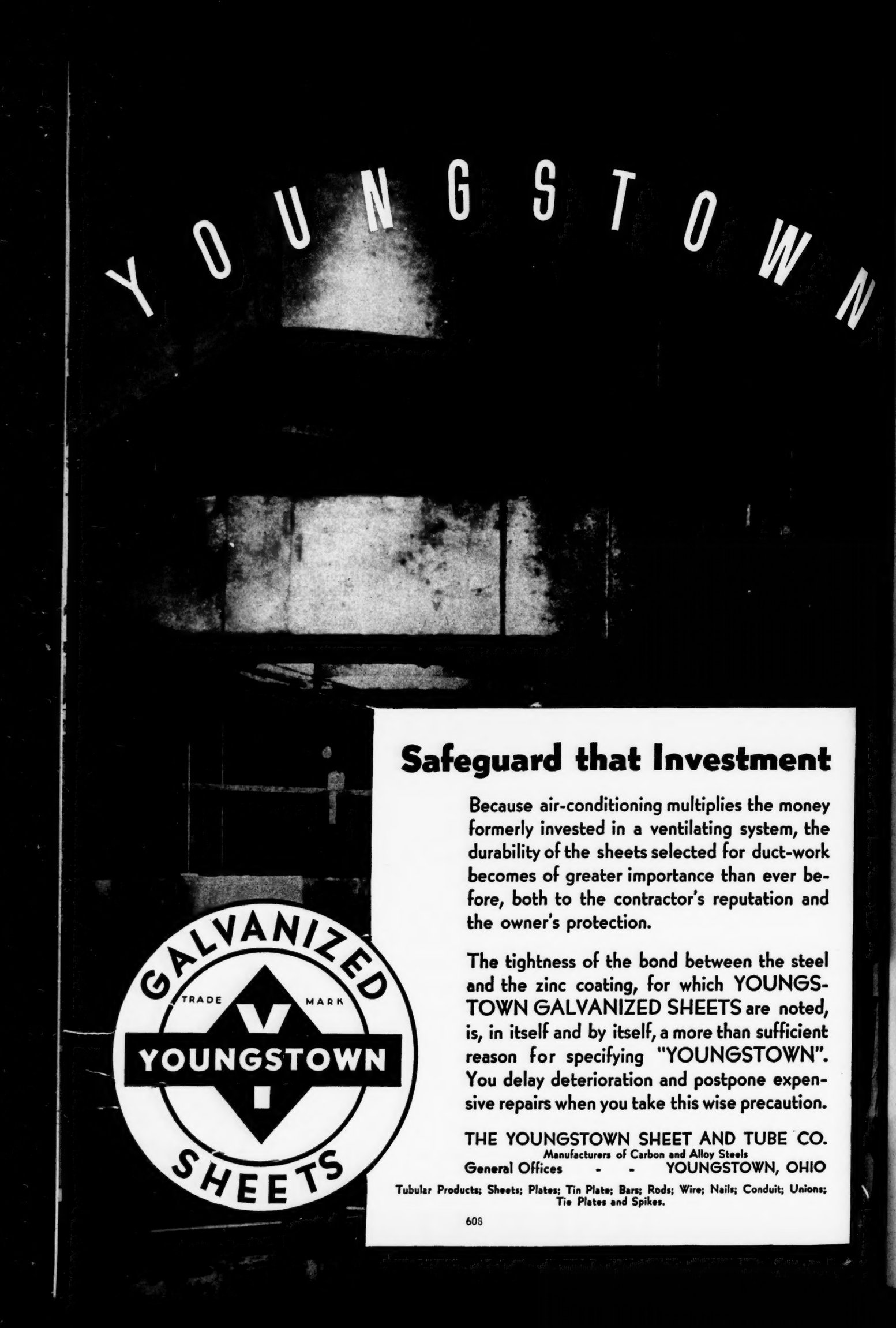
Faced with the problem of producing such enormous quantities of steam with absolute dependability and maximum economy, the designers of Kips Bay selected CE units for the initial installation of three boilers and for the two succeeding installations of one boiler each. All five units, in addition to CE Boilers, include Air Heaters, Water-Cooled Furnaces and Pulverized Coal Burners of CE design and manufacture.

Whether your boiler plant be large or small, you may enjoy the efficiency and economy of CE equipment. The complete CE line provides adequately for fuel burning and steam generating requirements from 30 hp boilers and small stokers up to the largest units. Specify CE equipment on your next installation . . . Combustion Engineering Company, Inc., 200 Madison Avenue, New York.

A-289

COMBUSTION ENGINEERING

All types of Boilers, Stokers, Pulverized Fuel Systems and Heat Recovery Equipment



Safeguard that Investment

Because air-conditioning multiplies the money formerly invested in a ventilating system, the durability of the sheets selected for duct-work becomes of greater importance than ever before, both to the contractor's reputation and the owner's protection.

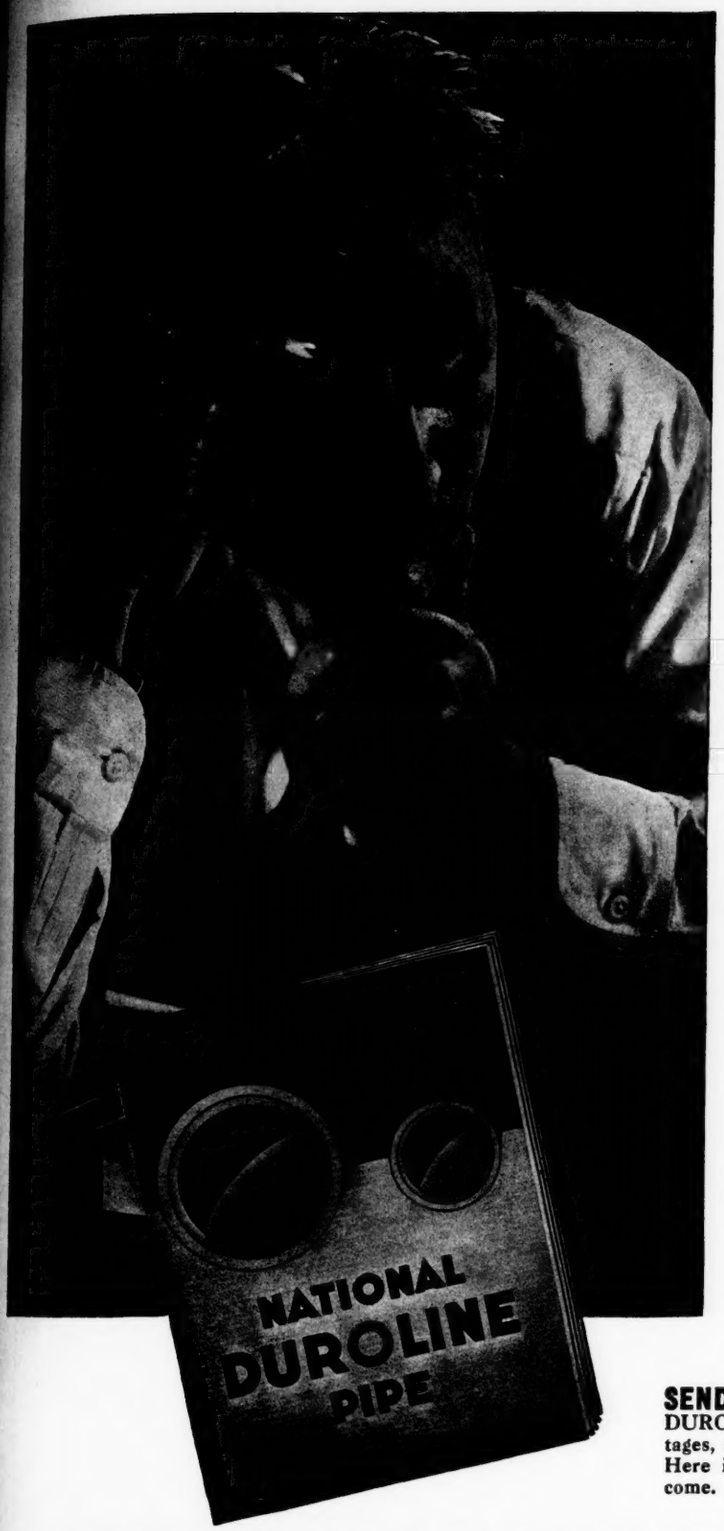
The tightness of the bond between the steel and the zinc coating, for which YOUNGSTOWN GALVANIZED SHEETS are noted, is, in itself and by itself, a more than sufficient reason for specifying "YOUNGSTOWN". You delay deterioration and postpone expensive repairs when you take this wise precaution.

THE YOUNGSTOWN SHEET AND TUBE CO.
Manufacturers of Carbon and Alloy Steels
General Offices - - YOUNGSTOWN, OHIO

Tubular Products; Sheets; Plates; Tin Plate; Bars; Rods; Wire; Nails; Conduit; Unions; Tie Plates and Spikes.

608

DOES WATER LINE CORROSION WORRY YOU?



Here's welcome News!

HAVE you heard of Duroline Pipe?... steel pipe with a highly improved lining — DUROLINE — specially developed to resist the destructive action of waters that rust, corrode and tuberculate ordinary unprotected piping.

Waterworks superintendents and engineers will find in Duroline Pipe a happy combination of true economy and long, trouble-free service. For along with the special interior protection it affords, it offers the strength, long lengths, convenient joints and other desirable features of steel pipe.

On supply, distribution and service lines, Duroline Pipe has demonstrated its ability to reduce maintenance costs — to eliminate interruption of service — to maintain desired flow without expensive cleaning of mains as the lines grow older. Corrosion and tuberculation troubles can be dismissed from your mind the day you install it.

This pipe is sold at nominal cost — comparable to galvanized pipe — why not investigate?

NATIONAL

DUROLINE

PIPE

"It's Lined to Endure"

SEND FOR THIS BOOK: A comprehensive treatise on DUROLINE pipe, its manufacture, characteristics, advantages, methods of application and its use for various services. Here is information every water supply engineer will welcome. Your copy is waiting.

NATIONAL TUBE COMPANY

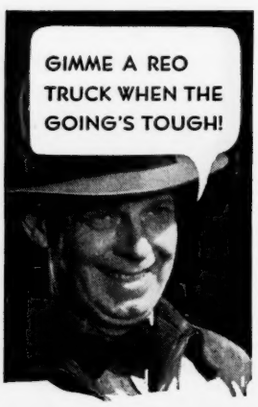
PITTSBURGH, PA.

Columbia Steel Company, San Francisco, *Pacific Coast Distributors* · United States Steel Products Company, New York, *Export Distributors*

UNITED STATES STEEL

"HIGH-BALLING" OR HEAVY HAULING

—A REO TRUCK CAN TAKE IT!



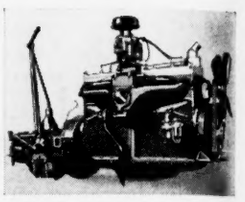
Reo Speedwagons and Trucks range from ½ to 4-6 tons. Chassis prices from $445 up, f. o. b. Lansing, plus tax. *½-ton chassis, f. o. b. Lansing, plus tax.

REGARDLESS of how varied or tough the tasks you assign it, the rugged Reo truck can be depended upon to come through with flying colors.

Reo trucks are built from the ground up for heavy duty purposes. Their sturdy Reo Gold Crown and Silver Crown truck engines have extra strength and wearing qualities built in at every point. They are *tough truck engines* designed specifically for tough truck service. On the road and on your cost sheets, they prove their ability to make money and save money on every hauling job.

Every heavy duty Reo truck has a husky 7-bearing crankshaft. Two-speed rear axles, 5-speed transmissions and double-reduction axles are now available. Consult the nearest Reo dealer on your truck requirements. He will help you select the truck that is "tailor-fitted" to your needs. Call him today. There is no obligation.

Climbing grades up to 45%! Two Reo trucks, loaded to full rated capacity, climb Stone Mountain over rocks and boulders.



All Reo Speedwagons and Trucks are powered with rugged, economical, Reo-built Gold Crown or Silver Crown truck engines. For 1936, these famous motors have been made even more efficient.

America's Toughest Truck!

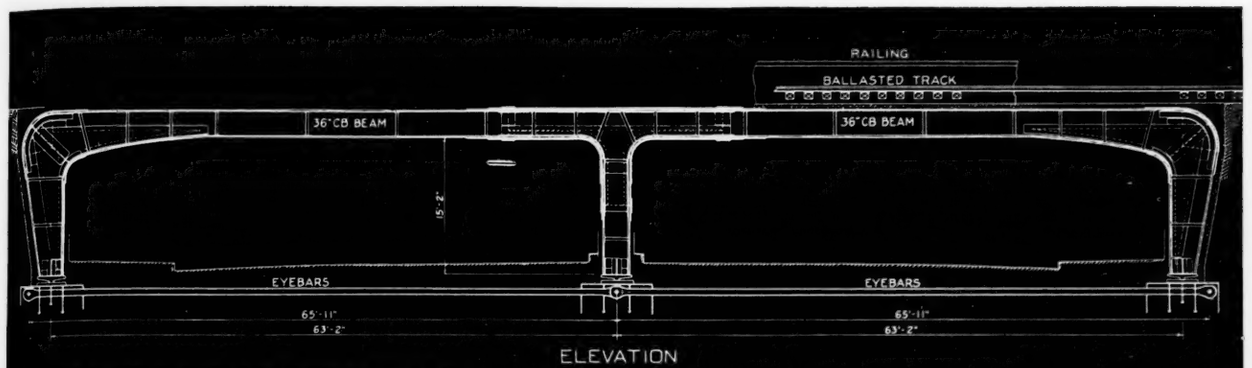
In repeated tests, a 1936 Reo 2-3 Ton Truck, equipped with the Reo Gold Crown Engine, pulled an 80-ton load without laboring!

REO SPEEDWAGONS AND TRUCKS

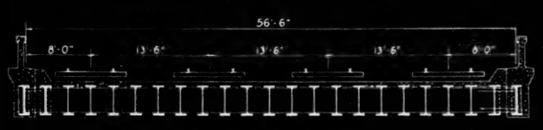
Announcing . . .

BEAM ARCH CONSTRUCTION

applied to Rigid Frame Bridge

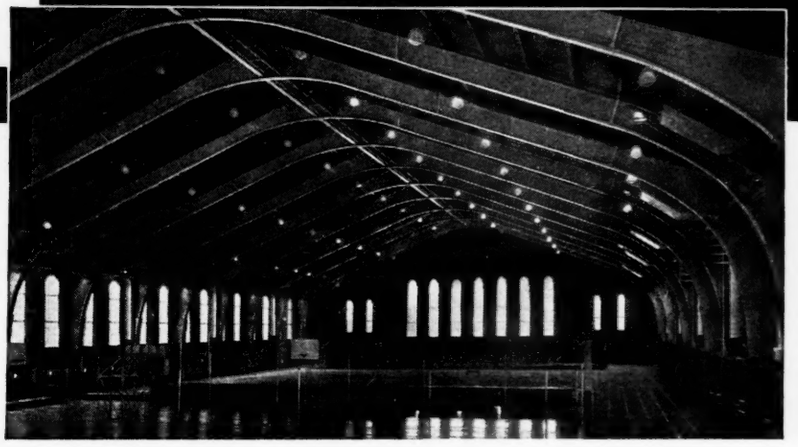


ELEVATION



CROSS SECTION

A DEMONSTRATION *of Beam Arch in bridges is found in the Rigid Frame Bridge for grade separation of New York Central and Rock Island Railroads at Cermak Road, Chicago, Ill. Beam Arch has many advantages (1) shallow depth of horizontal member, minimum excavation or embankment fill needed to keep underneath clearance; (2) suited to longer spans with no obstructing columns; (3) shallow clear-deck floor unobstructed by top flanges of through girders; (4) erected in sections, less traffic interruption. This bridge now under construction for State of Illinois, Dept. of Public Works and Bldgs., Division of Highways, Ernest Lieberman, Chief Engineer.*



THE sweeping curve of roof construction and the vaulted profile of bridge spans can now use to advantage the Beam Arch as developed by American Bridge Company. In addition to its innate beauty it has many economies—it is fabricated from Carnegie-Illinois rolled CB beams; it is shipped in large sections to simplify and speed field erection; it has low maintenance costs for the large plain surfaces are easily inspected and painted, while offering no inaccessible surfaces or pockets to collect dirt.

Beam Arch construction is new and modern. It offers the ultimate in appearance, strength and economy. Call on us for additional information or suggestions.

THIS FIELD HOUSE *for University of Chicago built in 1931, the first major installation of American Bridge Company Beam Arch, demonstrated the advantages for buildings—(1) long span construction (spans up to 200 feet have been built); (2) no interior posts or deep trusses, unobstructed light, ventilation and vision; (3) balconies may be cantilevered from columns, no unsightly hangers above or posts below; (4) shallow depth of arch member, lower roof line reduces height of enclosing walls. Field House is 168'2" wide, 68' high at center. Architects, Holabird & Root; Associate Architect, Emery B. Jackson.*

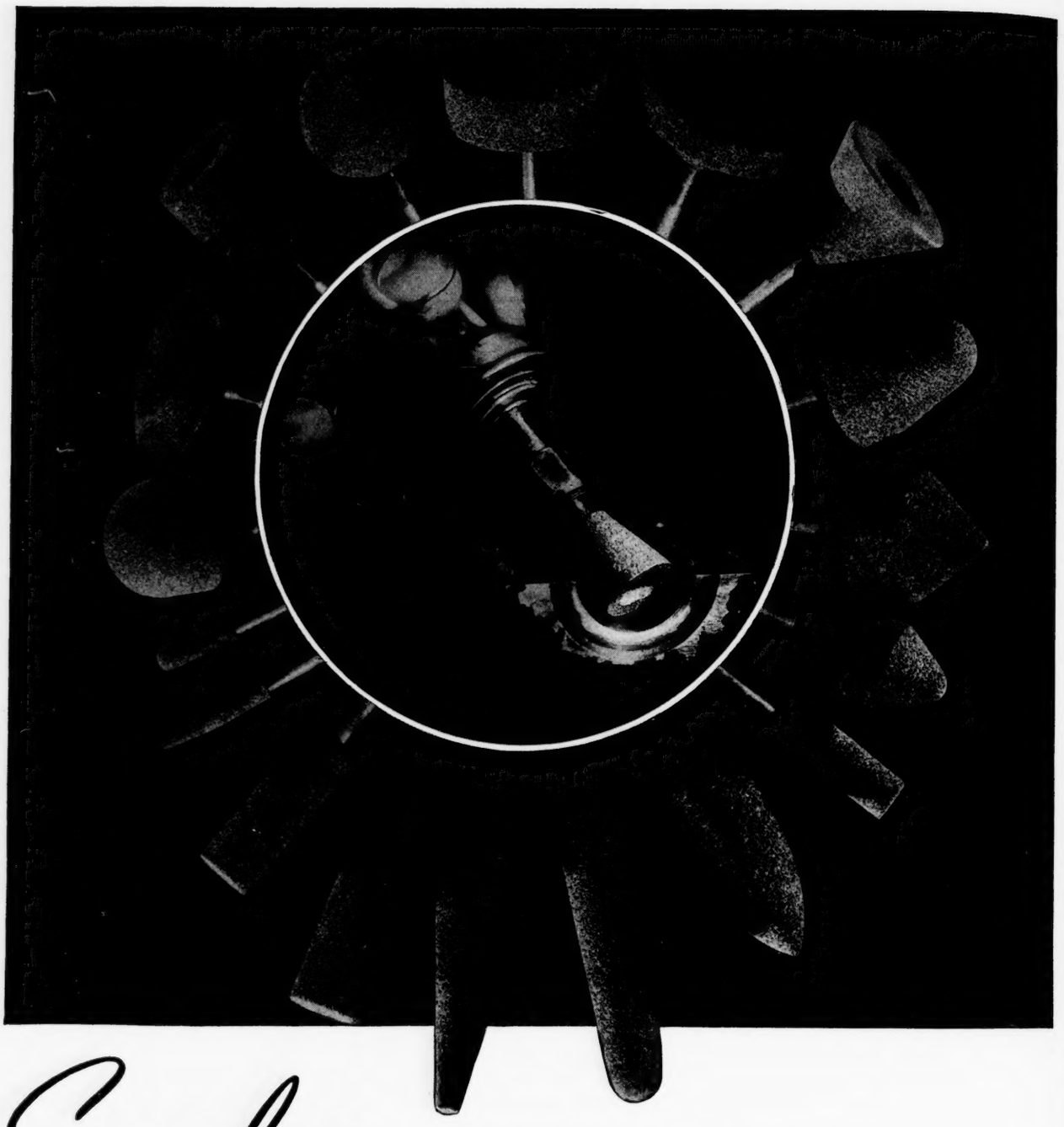
AMERICAN BRIDGE COMPANY

General Offices: Frick Building, Pittsburgh, Pa.

Baltimore · Boston · Chicago · Cincinnati · Cleveland · Denver · Detroit
Duluth · Minneapolis · New York · Philadelphia · St. Louis

Columbia Steel Company, San Francisco, *Pacific Coast Distributors* · United States Steel Products Company, New York, *Export Distributors*

UNITED STATES STEEL



Speed up PORTABLE GRINDING JOBS

Carborundum and Aloxite Brand mounted points and wheels cut fast. They are made in a wide variety of shapes, sizes and grades for removing stock; for producing a high uniform finish and grinding to close limits.

Try them on those high speed portable grinding jobs. They hold their shape. They are securely mounted on rust proof spindles. They show long life. They cut clean.

Send for complete illustrated catalog

THE CARBORUNDUM COMPANY
NIAGARA FALLS, N. Y.

Sales Offices and Warehouses in New York, Chicago, Boston, Philadelphia, Cleveland, Detroit, Cincinnati, Pittsburgh, Grand Rapids

(Carborundum and Aloxite are registered trade-marks of The Carborundum Company)

Let's Go AHEAD . . . . INSTEAD!

"The presence of Government competition has created such market uncertainties that the preferred stocks of our southern companies are selling at 30 to 40 points below par and it is impossible for them to refund their bonds and preferred stocks or to publicly finance their construction requirements. The money for such construction requirements has, therefore, of necessity been supplied by this Corporation, the holding company.

"This penalty which is being levied . . . by Government incursion into the field of private enterprise, will, unless brought to a halt, of necessity be paid for by either you as security holders by the rate payers—and probably by both."

—President Wendell L. Willkie
1935 Annual Report to Stockholders

A vivid demonstration of the destruction resulting from politically-inspired and fomented assaults on the utility industry. That is typical of the damage created in but one of many directions.

As a manufacturer, an employer, a consumer, a tax-payer, ask yourself what this program of crippling legislation, "death penalties" bureaucratic experiments and tax-subsidized competition is doing FOR you or TO you. What has this program done to foster industrial and commercial development, strengthen the position of invested savings, or establish firm foundations for steady employment? Does the public stand to gain more from electric service administered under EXPERIENCED AND RESPONSIBLE PRIVATE MANAGEMENT, or subject to shifting political direction?

In the face of governmental interference and unfair restrictions, the electrical industry is bending every effort to further develop its services. Freed from these handicaps, it is prepared to *go ahead* with greater contributions to the public welfare.

Let's go ahead!

THE COMMONWEALTH & SOUTHERN CORPORATION

MICHIGAN - OHIO - ILLINOIS - INDIANA - PENNSYLVANIA - GEORGIA - FLORIDA - MISSISSIPPI - SO. CAROLINA - ALABAMA - TENNESSEE

FOR SERVICE THAT'S ALIVE AND ALERT MANUFACTURERS SPECIFY

SOLVAY

TRADE MARK REG. U. S. PAT. OFF.

In modern plants, reliability of service is of paramount importance. If you have a service problem, it can often mean the difference between success and failure in operations. That is why leading manufacturers are turning more and more to Solvay for on-time deliveries from over 100 stock points as well as products that meet every specification as to quality and uniformity.

SODA ASH (58%)

Light • *Fluf (Extra Light) • Dustless Dense

*Trade Mark Reg. U. S. Pat. Off.

Graded to meet the exacting needs of many industries. Produced to standards which assure unvarying uniformity in strength and purity.

CAUSTIC SODA (76%)

Solid • Ground • Flake • Powdered • Liquid

Meets every quality demand. Dependable. Uniform. Full strength. Pure. Accepted everywhere as standard.

TEXTILE SODA

for finishing

Used extensively with marked success when a product milder than Soda Ash is desired. Especially favored for wool scouring and finishing—and cotton cloth finishing.

LIQUID CHLORINE
SODIUM NITRITE
POTASSIUM CARBONATE

(Liquid 47% • Granular Hydrated 83-85%
Dustless Calcined 98-100%)

OTHER SOLVAY PRODUCTS

CALCIUM CHLORIDE · SODA ASH · CAUSTIC POTASH · MODIFIED SODAS
ORTHO-DICHLOROBENZENE · CAUSTIC SODA · PARA-DICHLOROBENZENE
AMMONIUM CHLORIDE · SPECIAL ALKALIES · AMMONIUM BICARBONATE

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SOLVAY SALES CORPORATION

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Plants at Syracuse, N. Y., Detroit, Mich., and Baton Rouge, La.

BRANCH SALES OFFICES:

BOSTON					PITTSBURGH
CHARLOTTE	CINCINNATI	DETROIT	INDIANAPOLIS	NEW YORK	ST. LOUIS
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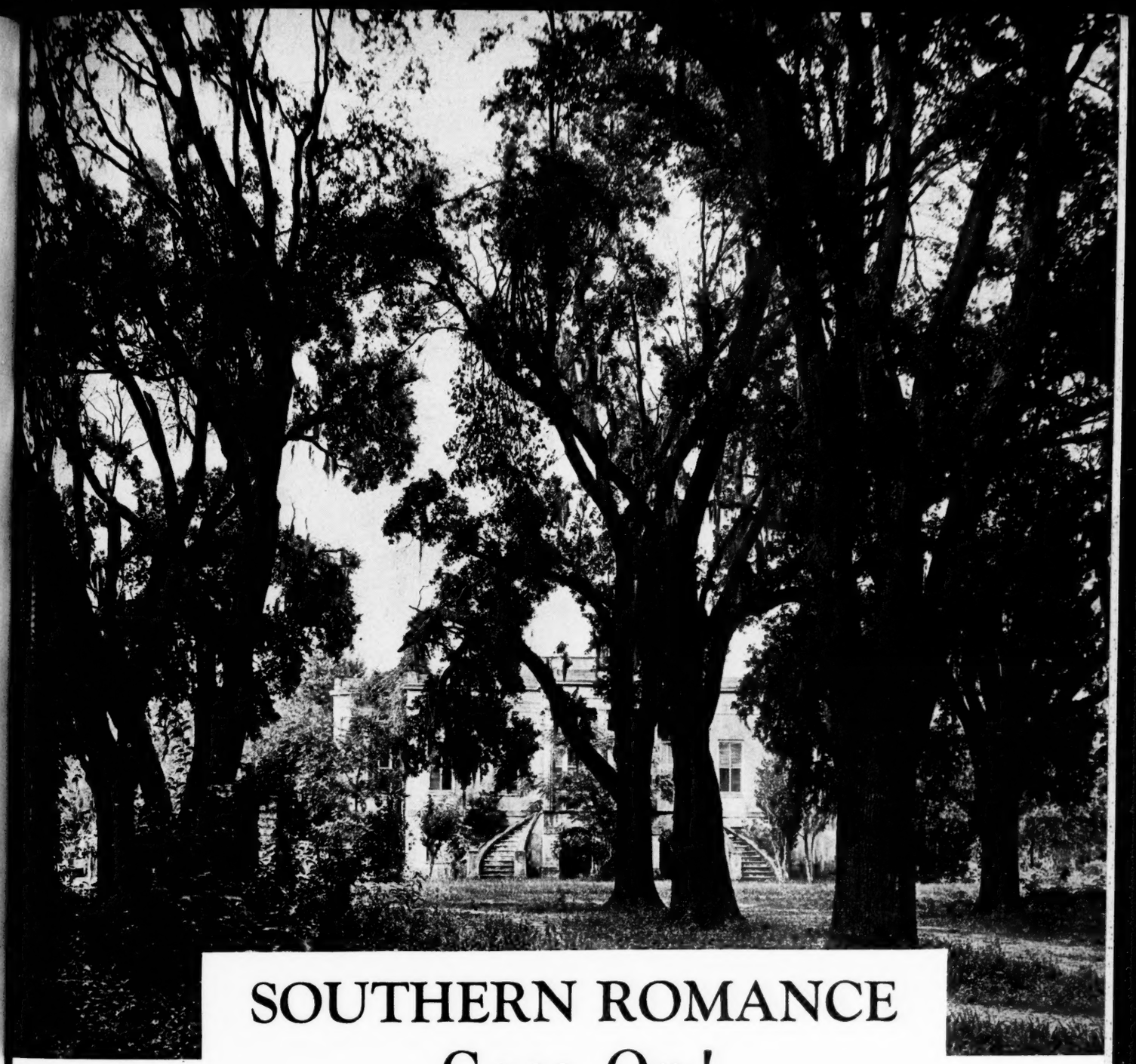


SOUTHERN ROMANCE
Goes On!

CHANGING, it's true. But what was enjoyed by comparatively few in years gone by, is now available to millions of the South and the nation.

Modern highways and other means of transportation have opened up magnificent forests and parks undreamed of in old plantation days. Notable universities and colleges, private and state, with beautiful settings retain the distinctive charm and romance of the old South.

Among the South's public libraries, schools, churches and hospitals are those that are internationally known and world famous.

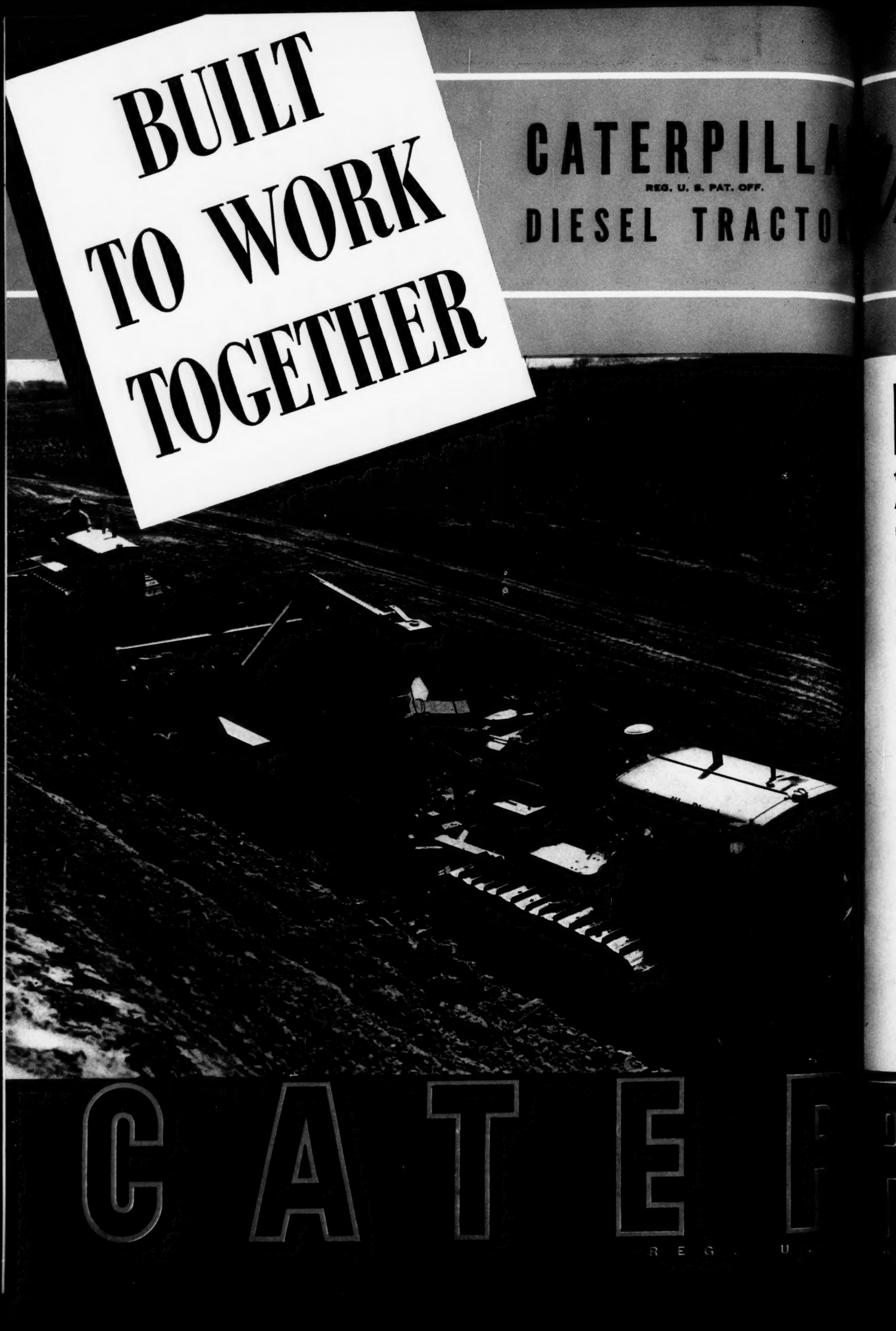
These are only a few cultural accomplishments, an outgrowth of the South's industrial development. In the worst of the depression years the South produced eleven billion dollars of wealth. The industries responsible for this vast output are founded on resources unequalled in their extent and variety—developed, operated and controlled by men of vision, whose persistent labors enabled them to rise from the bottom to places of influence among the South's industrial leaders.

Many Southern plants have grown to where they are now the largest of their kind in the United States and the world.

Each month the MANUFACTURERS RECORD tells what the Industrial South is doing. There are many reasons why this development creates the most interesting market in the country to manufacturers of machinery, equipment, materials and supplies for the sale of their products. News items on every worthwhile Southern industrial and construction project of $10,000 or over are published by the MANUFACTURERS RECORD.

MANUFACTURERS RECORD

BALTIMORE, MARYLAND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ATHEY TRUSS WHEEL CO. . . . Track-type Wagons, all types and sizes.

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R. G. LeTOURNEAU, INC. . . . Cable-operated Bulldozers, Trailbuilders, Scrapers, Buggies and Rippers.

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KILLEFER MFG. CORP., LTD. . . . Rollover Scrapers and Rippers.

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to meet the conditions on your job. "Caterpillar" distributors are able to recommend the proper balance of Diesel power and auxiliary equipment. As every contract presents a new problem, consult your "Caterpillar" distributor as to the most efficient and economical tractor and tool combinations. To tractor users, this eliminates guesswork in choosing equipment. It assures the BALANCED combination that is best for performance, economy and stamina. . . . Tractors built to utilize the full capacity of equipment—equipment built to take full advantage of the tractor's power—both built to give dependable, uninterrupted performance—balanced combinations.

COMPLETE JOB ANALYSIS

"Caterpillar" distributors are equipped to make a complete job analysis—ready to help tractor users analyze their jobs and recommend the equipment best suited for them.

WIDE EXPERIENCE

The unequaled experience of "Caterpillar" distributors—with Diesel power on big jobs as well as small—with all kinds of equipment and methods—can be a valuable help to any tractor user.

ONE SOURCE OF SERVICE

Both tractors and equipment are sold and serviced by "Caterpillar" distributors, with parts and service facilities competent for both tractor and equipment work.

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The coupon below will bring you complete information on the balanced equipment for the type of job you are doing. Fill it out and mail to Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

CATERPILLAR TRACTOR CO., Peoria, Ill., U. S. A.

Gentlemen:

I am interested in a balanced combination—"Caterpillar" Diesel Tractor and_____ _____equipment for a_____job.

I would like to hear about it from a distributor.

My name is_____

My address is_____

My job is located_____

PILLAR

The RADIAL CONE Design . . . .
an *important factor* in municipal engineering

RECENT improvements in the waterworks system at Alva, Oklahoma, call attention to two important factors in municipal engineering.

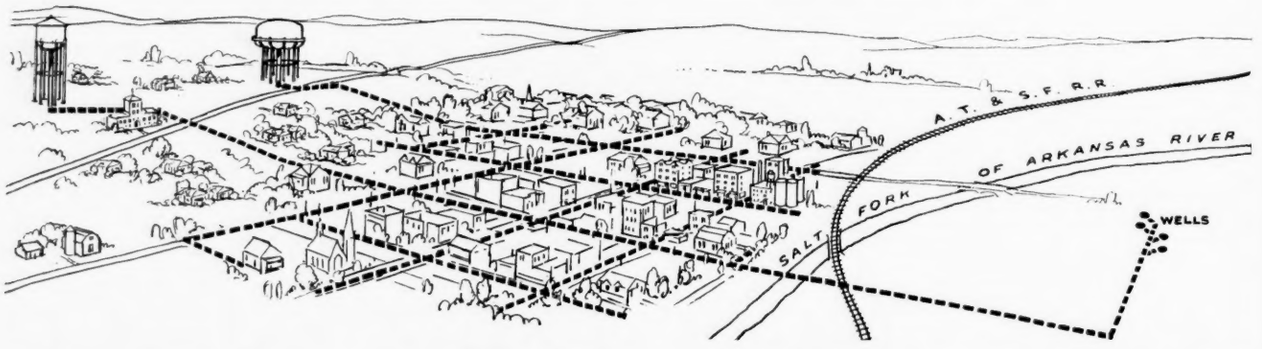
FIRST—The elevated storage capacity in the system was increased by the addition of a 500,000 gal. radial-cone tank. This particular design has a relatively shallow depth, cutting down variations in pressure in the distribution system as the level of the water in the tank changes.

SECOND—The elevated storage is located opposite the main portion of the city from the source. This means that the area of highest demand will be served from two directions during peak load periods, and reduces the size of transmission mains necessary to provide adequate pressure.

When considering improvements in your waterworks system, engage an experienced consulting engineer to lay out such improvements in the most advantageous manner. Specify ellipsoidal bottom elevated tanks, or radial-cone designs for large capacities, to obtain maximum benefits from your elevated storage. Write our nearest office for information or estimating prices.

The new 500,000-gal. radial-cone tank in the Alva, Oklahoma waterworks system is illustrated above. The diagrammatic illustration below shows the relative location of the elevated storage tanks and the source. The wells are five miles northwest of the city while the elevated tanks are located on the opposite side of the main business district.

The city has also taken advantage of the fact that it is located on a hillside, by locating the tanks on high ground. The high water levels of the two tanks in the system are at the same elevation, approximately 250 ft. above the ground level at the wells and 200 ft. above the main business district.



CHICAGO BRIDGE & IRON WORKS

Birmingham	1530 North Fiftieth St.	New York	3313-165 Broadway Bldg.	Philadelphia	1619-1700 Walnut Street Bldg.
Dallas	1408 Dallas Athletic Club Bldg.	Cleveland	2216 Rockefeller Bldg.	Detroit	1510 Lafayette Bldg.
Houston	2919 Main Street	Chicago	2106 Old Colony Bldg.	Boston	1510 Consolidated Gas Bldg.
Tulsa	1611 Thompson Bldg.	San Francisco	1040 Rialto Bldg.	Havana	Edificio Abreu 402

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B-463

• Manufacturers Record •

WHAT SECURITY?

STARTING January 1, 1937, employers and employees in business will be taxed to build a reserve fund for Unemployment Insurance and Old Age Pensions which, by 1980, will total 47 billion dollars, where it will be stabilized according to present plans.

Considering the far-reaching effect the Social Security Act will have on the working population, the changes in business operation involved, and the enormous increase in taxes it will cause, it is a formidable piece of legislation and much too important to have been acted upon in the hurried, indifferent way it was.

It is designed, of course, to aid unfortunates out of employment, and those who are too old to work; to render them at least partly independent of outside support.

To those who have analyzed it, the Social Security Law is full of irony. During a session of Congress when a great drive was made to make the rich pay for increased government expenditures through a bill levying 800 millions of new taxes, this other new tax, from which the rich are practically exempt, was passed, levying a burden on the working masses of 47 billion dollars —one and one-half times the present Federal debt. For, the Unemployment Insurance part of the plan will impose, eventually, a tax of 3 per cent on payrolls of all enterprises, not excluded by the law, employing 8 or more persons, and the Old Age Pension part will impose another 3 per cent on all salaries under $3,000 per year.

And there are still other vagaries. For example, since the 47 billion dollar reserve fund can only be invested in Government securities, it is at once apparent that under the Social Security Law, our National debt, which at 34 billion dollars has already exceeded all previous figures, will be increased to at least 47 billions and never reduced below that figure.

When the plan is stabilized, business and the working public will have to pay, in direct contributions to the reserve fund, between 3 and 4 billion dollars a year to keep the plan in operation. In addition, Congress will have to provide money to pay interest on the 3 per cent bonds in which the reserve funds are invested. Which, of course, is only another way of saying that the interest, which will amount to more than one billion dollars a year, will have to be paid by the taxpayer.

Here is a novel kind of insurance. Few capitalists are attracted to an investment—even an insurance policy—on which they pay the interest as well as the principal!

The annual contributions to the reserve fund and the interest on the bonds in which the funds are invested bring an added tax burden of 5 billion dollars a year, which does not include either the "ordinary" or "extraordinary" expenses of government now being borne under an Administration which is spending public funds at the present rate of nearly 9 billion dollars a year.

The bureau, which administration of this law will set up, can not help but be vast in size, to handle the detailed work involved in keeping accurate records of 25 million workers and their employers. We already see the large army of Government examiners and clerks required in the administration of the Federal Income Tax Law; but the task under the Social Security Act is multiplied many times over, for where there are only between two and three million individuals and 500 thousand corporations paying income taxes, according to 1934 figures, there will be more than 25 million contributors under the Social Security Act, on each of whom detailed records must be kept.

As in other Government undertakings, one thing leads to another, and this is more than usually true in the ramifications of the Social Security Act. By reason of the clause that Social Security funds must be invested in Government securities, Congress will be charged with the responsibility of spending 47 billion dollars more of the people's money. What projects will be conceived to spend such an enormous sum, it is difficult to imagine.

But to top it off, what assurance does the worker have that when he reaches 65 years of age, or when unemployment overtakes him, his hard-earned benefits will be available; or that some future Congress may not decide to use his money for some other purpose? He has no contract with his government nor a receipt for the money he has paid.

Would it not be better, if we must have compulsory unemployment insurance and old age pensions, to let established insurance companies handle it. They could do so at less cost to the beneficiaries who would be protected by honored, legal contracts. The funds would be invested in productive fields instead of public works or boondoggling projects yielding no return.

There can be no security under the Social Security Act in its present form.

FARM INCOME GROWS

FARM income from the sale of principal products is at the highest point since 1931. Southern farmers' cash receipts were up about 10 per cent in the first half of this year. The South Atlantic States showed a gain of 10 per cent, the South Central States about 3 per cent and the Southwest about 8 per cent.

Cash sales from 33 crops and livestock commodities by the farmers of the country during the first five months of this year amounted to $2,394,390,000, according to the Agricultural Department, as compared with $2,138,370,000 for the corresponding period of 1935, $1,854,251,000 in 1934 and $1,494,155,000 in 1933.

Farmers received in addition Government benefit payments totalling $112,415,000 during the first five months of this year, compared with $256,000,000 in 1935 and $119,788,000 in 1934.

It will be seen from the above that during the first five months of 1934 when income from cash sales was $1,854,251,000, benefit payments from the Government amounted to $119,788,000. In 1935 income from cash sales the first five months increased by $284,119,000; yet, in spite of this, Government benefit payments were double those for the same period of 1934. Again, in the first five months of this year, income from cash sales increased by $256,000,000 over the first five months of 1935, and the Government still paid out $112,415,000 in benefits.

In the light of increased income from cash sales and the farmers' improved net condition, one naturally wonders how much longer the taxpayers and consumers will have to pay bonuses to the farmers for reduced acreage.

It is true that farm groups in certain areas are in dire distress. As a recent survey conducted by the National Industrial Conference Board indicates, the situation throughout agriculture is by no means uniform, but the average economic condition of all farmers is probably not as bad as generally pictured.

The highly commercialized farm, specializing on cash crops, has been seriously affected by the decline in prices. Well-balanced, soil-conserving, character-building farming has brought profitable results despite adverse fators. The family farm has in general weathered the depression successfully. To the extent that such a farm is self-providing, it is able to maintain the family in fair comfort, even though its cash crops bring low prices.

The average net income of farmers in 1934 was $795 as compared with $1,335 in 1929. The greatest drop in average income, 60 per cent, was in the West North Central States, and lowest, 30 per cent, occurred in the East South Central region.

The Conference Board's study points out that these agricultural net income figures include only cash income received from the sale of crops together with income represented by farm products produced and consumed by the farm family valued at retail prices. They do not include income from work off the farm, nor miscellaneous income from other sources. The average income per farm operator is also reduced by reason of the inclusion under the census enumeration of a large number of persons who are not primarily farmers.

If these factors are taken into consideration, there is, according to the study, no conclusive evidence of a mass problem with respect to relative incomes of the agricultural population and of the urban working population.

The average net income of farmers from farming for the country as a whole in 1929 was about $1,350. The average full-time employee's salary and wage income for all industries in 1929 was about $1,450. The average wage in manufacturing was approximately $1,300.

There would be no farm problem if it were not the practice in this country throughout wide areas to depend on the cash income from one crop for practically all living necessities. A few bad years and one-crop farmers must go heavily in debt to buy food and clothing, and seed and fertilizer for next year's planting. There is a place, of course, for cash crops, but it should be secondary from the farmer's viewpoint. If each farmer made his land produce as much as possible of the food he needs, devoting the remainder of his time and acreage to volume production of cash crops, there would be no need for Government farm subsidies which can only encourage poor farming practices.

A DISTURBING TREND

GOVERNMENT activities in the field of business are rarely stopped at the boundary limitations of the projects for which they are proposed. They always go further. One thing usually leads to another, and the danger of government operation in any business field, aside from the injury done through unfair competition with private enterprise, removal of wealth from tax rolls and an increase in government expenditures, is that too frequently such a move makes another step toward absolute socialism a practical expedient and seemingly inevitable. The trend has been well established.

Take the TVA for example. When the TVA was started, flood control and navigation were its primary objectives, with the sale of hydro-electric power added to establish a "yard stick" of fair prices for electricity sold by private companies throughout the country. The actual power produced in this model plant was to be used in bringing, with the help of other government agencies, more of the comforts and advantages of modern life to inhabitants of certain rural areas not yet blest with electric lights and washing machines. The government now finds itself with a large surplus of electrical power on its hands as was predicted when the project was started. It must either be sold or the equipment producing it is a dead expense.

The situation offers the plausible solution of electrifying the railroads and this may have been at the bottom of the Federal Power Commissioner's recent suggestion that the electrified rail mileage of the United States should be trebled, at a cost of $600,000,000.

The railroads themselves will have a difficult time in raising the money necessary for a project of this size, except through government lending agencies. Nor

has it been proven that electrification is the answer to the problem of modern railroading, and it is extremely doubtful that the carriers would make an investment of this size for electrification even if they had the money and would not have to borrow. A loan of this size, with the RFC railroad loans already outstanding, would constitute a major hold on railroad properties by the government, and government ownership of the rails would be practically established, in fact if not in name.

Fortunately, so far this is only a possibility; but as a possibility it does serve to emphasize a trend which points directly, and has pointed for some time, to government ownership of railroads; and because of increasing Federal regulation of the carriers, the surplus power mentioned above and increasing pressure of various political groups to spend public funds for every conceivable purpose under the banner of Relief, Recovery, and Reform, the possibility appears very real and definitely disturbing.

LOST COTTON MARKETS

RECENT gains in cotton consumption and exports have been encouraging. The cotton situation, however, is not so bright when present production and consumption figures are compared with previous decades and markets.

With American cotton production actually less than it was 25 years ago, and with the decrease in consumption far greater than the lower production figures indicate, there has been a population increase in the United States of nearly 40,000,000 people. World population has increased by several hundred million people during this period, but the gain is not reflected in American cotton exports. These facts, pointed out by the Cotton Research Foundation of Memphis, are of vital concern to the country.

Furthermore, more than half of the present domestic consumption of cotton goes into industrial uses, something like 600,000 bales are used for automobile tires a year, and most of this outlet for cotton was non-existent 25 years ago. New uses for cotton have been developed and more are in sight, yet cotton consumption in this country remains far behind the growth of wealth and population.

Domestic Consumption of Cotton		Population United States Census	
Average	Bales		
1910-14	4,868,000	1910	91,972,000
1915-19	6,178,000		
1920-24	5,653,000	1920	105,710,000
1925-29	6,470,000		
1930-34	5,417,000	1930	122,775,000
1935	5,240,000	1935	130,000,000

In the five-year period 1910-14, the United States used 4,868,000 bales annually and in the six years 1930-34, used only an average of 5,330,000 bales. In other words, with 40,000,000 more people we used only about 400,000 bales more. This increased population makes a country as large as France and more than one-half the population of Germany. On top of this, there has been a great industrial expansion and more industrial uses of cotton in the United States since 1910.

An analogous situation exists in our foreign cotton trade. American cotton exports averaged during the five-years 1931-35, 7,316,000 bales, but during the past two years have been below the five-year average exports of 1911-15.

COTTON EXPORTS

Average	Bales
1911-15	6,125,000
1916-20	6,770,000
1921-25	6,639,000
1926-30	8,287,000
1931-35	7,316,000
1934	5,943,000
1935	6,093,000

Cotton exports in 1912 of 10,719,000 bales and in 1927 of 11,243,000 bales were our record exports. In 1932 and 1933, when prices were at the bottom of the depression, there was a revival of our foreign cotton trade followed by a drastic decline in exports after we arbitrarily raised prices and cut acreage. Although we had huge cotton stocks in this country, foreign cotton interests turned to cheaper markets in other cotton growing countries and stimulated production outside of the United States with the result that the United States, which had formerly been producing from between 54 and 64 per cent of the world's cotton output, dropped to about 42 per cent for each of the past two years.

COTTON ACREAGE AND PRODUCTION

Average	Acres	Production Bales	Per cent of World's Output
1910-14	34,506,000	13,815,000	55
1915-19	35,962,000	11,482,000	56
1920-24	35,581,000	10,984,000	55
1925-29	44,882,000	15,268,000	58
1930-34	35,737,000	13,342,000	54
1934	26,866,000	9,636,000	43
1935	27,335,000	10,638,000	42

The average production of cotton for the five-year period 1930-34 and for 1935 was below the 1910-14 average, while the population of this country increased more than 40,000,000 with consumption running at about the level of 1910-14.

So while the United States has been losing its foreign cotton market in attempting Government price pegging and production control, the cotton industry has failed in part to meet progressive competition of other fibres.

The loss of the American cotton trade has been due partly at least to changes in fashion and in modes of living. People do not wear as many clothes as in previous decades. Fashions for women have abolished the long skirt and the voluminous and many petticoats formerly worn.

The only way to widen the market for cotton is to find new uses for it, industrially and in consumer goods. Some progress has been made in this direction.

The cotton grower's problem now, as it has always been, is to produce the highest quality cotton and keep the unit cost of production low by proper land selection and cultivation. This must be supplemented by efforts to diversify his farming to make his land more self-sustaining. We can never hope to get back our foreign cotton markets if cotton prices are pegged above the world level.

THE NATION'S POWERHOUSE—

By

J. V. Sullivan

Secretary West Virginia Coal Association
Charleston, W. Va.

FUEL and power are basic essentials of modern industry. The fabled wealth of antiquity and the opulence of the Indian princes pale into insignificance when measured by the gigantic deposits of bituminous coal, oil and natural gas, with which nature lavishly endowed the South. These natural resources guarantee the future industrial supremacy of the South.

Sixteen Southern states, with only 31 per cent of the area of the United States, produced in 1935, 46 per cent of the nation's supply of bituminous coal; 65 per cent of the petroleum; 70 per cent of its natural gas, and 30 per cent of the electrical energy generated by water power plants. Nowhere in the known world has there ever existed such a concentration of diversified forms of energy in a comparable limited area. The South is truly the powerhouse of the nation.

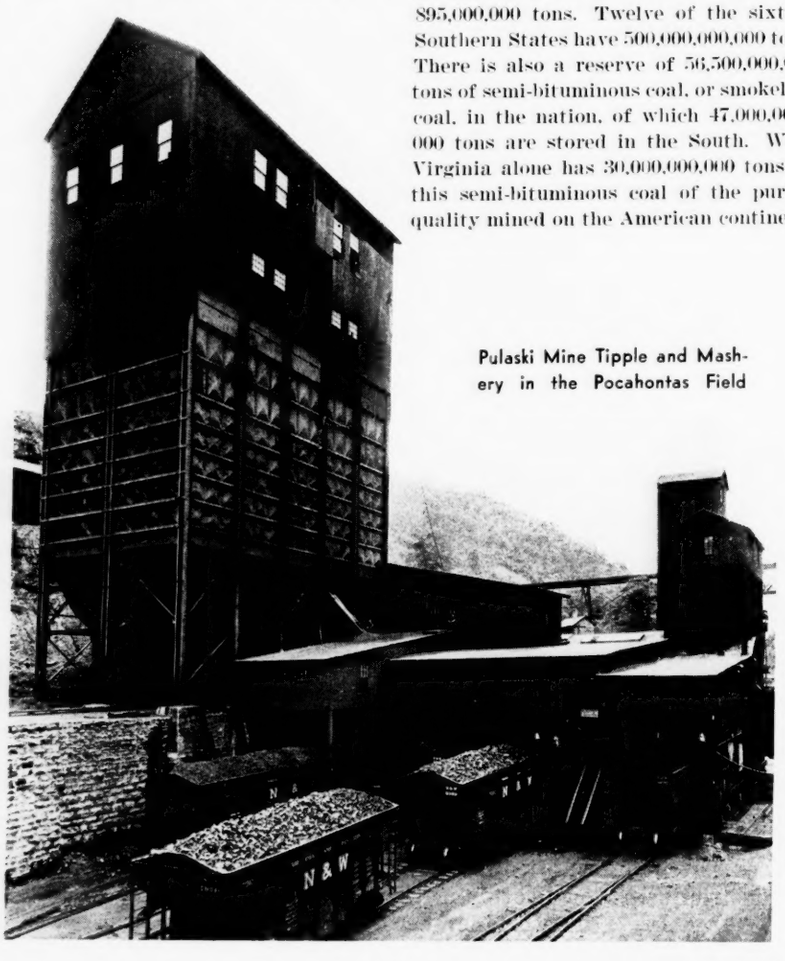
Gigantic Coal Reserve

Geologists estimate there are 547,000,000,000 tons of bituminous coal in the South, or 36 per cent of the national reserve in 31 per cent of the area. It is a gigantic reserve of power and energy in such quantity as to bewilder the imagination. In this reserve are billions of tons of the highest quality of coal found in the world. It exceeds in volume the total supply of coal in the whole of Europe.

If all of the bituminous coal of the South were mined and stored on one square mile, it would make a mountain of coal towering through the stratosphere for 94 miles. It would blanket the entire acreage of the sixteen states with a layer of six inches of coal. If loaded into railroad cars, it would require 114,800,000 trains one mile in length, each pulling 5,000 tons of coal, to haul it to market. These trains, if placed end to end would encircle the earth nearly 4,500 times.

This stupendous reserve of coal in the South should be impressive and reassuring to those who might be impressed with the repeated chant that coal is a decadent industry.

In the continental United States there is a bituminous coal reserve of 1,429,895,000,000 tons. Twelve of the sixteen Southern States have 500,000,000,000 tons. There is also a reserve of 56,500,000,000 tons of semi-bituminous coal, or smokeless coal, in the nation, of which 47,000,000,000 tons are stored in the South. West Virginia alone has 30,000,000,000 tons of this semi-bituminous coal of the purest quality mined on the American continent.



Pulaski Mine Tipple and Mashery in the Pocahontas Field

JESSE V. SULLIVAN, Charleston, W. Va., Secretary of the West Virginia Coal Association, was born in Ohio, spent his boyhood days in the Southern Ohio coal fields and came to West Virginia in 1904. After his early experience at the mines, he became a newspaper writer, served his State as Secretary of the State Council of Defense during the World War, was private secretary to Governor E. F. Morgan, and then became affiliated with the coal association which he has served as secretary for six years.

Competitive Conditions

Competitive conditions between the Southern and Northern producing areas have been tense for many years. The struggle for supremacy in the consuming markets for more than two decades has been between West Virginia, Kentucky, Virginia and Tennessee mines, having nearly 60 per cent of the coal resources of the entire South, and Pennsylvania, Ohio, Indiana and Illinois, in the North.

In 1933, for the first time, the six Southern States gained the ascendancy in production and mined 152,000,000 tons, compared with 150,000,000 tons in the Northern Fields. Under the NRA, when labor differentials were narrowed and the benefits reaped by the Northern producers, the four Northern states produced 166,000,000 tons in 1934, and 170,000,000 tons in 1935, while the six Southern states

547,791,000,000 Tons of Coal in South

In the South Is a Gigantic Reserve of Power and Energy in Such Quantity as to Bewilder the Imagination. Its 547,000,000,000 Tons of Bituminous Coal, More than the Total in All of Europe, Would Require 114,800,000 Trains One Mile in Length Each Pulling 5,000 Tons of Coal to Move It. If Placed End to End These Trains Would Encircle the Earth Nearly 4,600 Times

Bituminous and Semi-Bituminous Coal Reserve

States	Tons
Alabama	67,583,000,000
Arkansas	1,396,000,000
Georgia	933,000,000
Kentucky	123,327,000,000
Maryland	8,043,000,000
Missouri	84,000,000,000
North Carolina	200,000,000
Oklahoma	54,951,000,000
Tennessee	25,665,000,000
Texas	8,000,000,000
Virginia	21,149,000,000
West Virginia	152,544,000,000
Total South	**547,791,000,000**

produced 160,000,000 tons in 1934 and 162,000,000 tons in 1935.

The annual value of the national coal output exceeded $1,000,000,000 for the first time in 1917, soared above the $2,000,000,000 mark in 1920, and dropped to $1,030,000,000 in 1930 and fell to $406,677,000 in 1932, the lowest mark since 1908.

Increasing Production

Recovery in the coal industry began in 1933 with the advent of Appalachian Coals, Incorporated, a voluntary coal merchandizing agency embracing Southern high volatile districts. The total value of the national production moved upward in this year to $445,000,000, and continued in 1934 with an increase to $628,112,000. Estimates show a slight increase in 1935.

South's Part in Industry

Participation of the South in the coal industry is shown comparatively in the accompanying table for 1926, the most prosperous year of the industry; 1932, the most dismal coal year since 1908, and 1934, the last year for which data is available:

Year	South	United States	Percent South
1926			
Production ..	258,954,395	573,366,985	45.17
Number of Employees .	249,233	593,647	41.99
Value	$493,147,000	$1,183,412,000	41.66
1932			
Production ..	153,625,753	309,709,872	49.61
Number of Employees .	183,335	406,380	45.12
Value	$166,682,000	$406,677,000	40.99
1934			
Production ..	167,153,477	359,368,022	46.51
Number of Employees .	209,873	458,011	45.84
Value	$280,112,000	$628,112,000	44.60

An analysis of this tabulation reveals that from 1926 to 1934, 40,000 miners, or 16 per cent of those employed, lost employment in Southern mines, while the tonnage dropped 91,000,000 tons, or 35 per cent. In the remainder of the country, 96,000 miners, or 28 per cent of those employed, lost their employment, while production dropped 122,000,000 tons, or 38 per cent. Mine labor, it would seem, secured more employment in the South than in the North and West during the depression.

These figures also reveal a growing participation by the South in the national income of the coal industry. In 1926, the South with 45.17 per cent of the national production received only 41.99 per cent of the national coal income, but in 1934, with 46.5 per cent of the national tonnage, the South received 44.6 per cent of the national yield from coal.

$170,000,000 Payroll $40,000,000 for Supplies

According to the NRA coal code authorities, in 1933 the average cost of producing a ton of coal in the Appalachian area was $1.58. Labor, the largest item, cost 93c; mine supplies, 22c; royalties, compensation insurance and depletion, 15c; depreciation, taxes and insurance, 11c; other costs, 3c, and sales and administration 14c. Labor costs have now advanced to more than $1.00 per ton. This means that the coal industry in the South last year provided a payroll of at least $170,000,000, and that the industry spent nearly $40,000,000 during 1935 for mine supplies, including iron, steel, tipple equipment, oil, lumber and other articles of commerce.

Coal's contribution to Southern commerce is not measured solely, however, by the direct expenditures of the industry. Coal gives employment in related industries to one-third as many people as it sustains directly. The great coal carrying Southern railroads were the most prosperous of the nation's carriers during the depression years. The coal industry is one of the largest consumers of electric power furnished by public utilities. Upon it are dependent many large wholesale and retail trade houses, large manufacturing plants, mill and mine supply houses, all employing many thousands of workmen.

Problem of the Industry

Southern coal producers face the future with confidence in the full restoration of the bituminous coal industry. They are not unmindful that freight rates, labor differentials, fuel substitutes, improved combustion methods, mechanization and government control and regulation are continuing problems. In the solution of these problems they want and expect the support of all the people of the South to whom they make annually such overwhelming contributions.

Competitive struggles for the capture of large coal consuming markets have been waged for nearly 30 years between the competitive groups North and South of the Ohio River. The large coal consuming markets of the country are geographically closer to the Northern coal districts, but distance, to some extent has been eliminated as a factor by the capacity of the Southern carriers to reach the Northern, Eastern and Western markets. Northern shippers enjoy freight

(*Continued on page 62*)

Coal From Smokeless Fields Ready for Market

RESEARCH IN THE RAILROAD INDUSTRY

By

L. W. Wallace,

Director of Equipment Research, Association of American Railroads

THERE is a research pattern, as there is a pattern for castings, dresses and other articles in common use. For this discussion, the research pattern may be described as consisting of three major parts, to-wit: Fundamental, Creative and Applied Research.

The primary objective of fundamental research is to discover the basic principles underlying the universe and the circumstances of life. The purpose of this type of research is not to add to the financial assets of the world, but rather to broaden intellectual horizons.

In the realm of creative research the primary objective is to discover, invent or produce new materials, new processes, new equipment, or to find new uses for existing materials. In creative research the financial incentive plays a more important role than in the case of fundamental research. Creative research may be designated as producers' research, through which producers are enabled to manufacture and sell new and improved commodities.

Through the process of applied research there are determined ways and means of adapting to concrete problems the knowledge, materials, equipment and processes made available by fundamental and creative research. It is a process through which the user or purchaser intelligently selects the materials, equipment and processes best adapted to his purposes and needs. It may be designated as purchasers' or consumers' research through which the consumer is enabled to carry on his daily operations with greater economy, efficiency and safety.

Place of the Railroad Industry

THE railroad industry is neither a research agency nor a manufacturer. It is a purchaser and user of materials and equipment, and not a producer of them; its primary and only function is to provide comfortable, dependable and safe transportation for the public at a reasonable cost. This being the case, the place of the industry in the research pattern is the applied branch, not in either of the other two branches as has been alleged by some who have no intimate knowledge of, or experience with railroad operations.

Results of Applied Research

IN order to discharge its primary function adequately and satisfactorily, the railroad industry has engaged in applied research throughout its history. This is neither the time nor place to review the research activities of the industry extensively. However, it is appropriate to refer to some of the things which have occurred in late years.

In the last 10 years, there have come into being a series of high-speed passenger and freight trains. In many important directions there is expressed, in the design of the locomotives and cars of these trains, radical departures from their predecessors. And back of these departures from the so-called conventional equipment are years of study, experimentation and experience.

THE professional career of the author, who was graduated from the A. & M. College of Texas, began as a special apprentice with the Gulf, Colorado & Santa Fe Railroad Co. Completing the apprenticeship in 1906, he became a member of the staff of the School of Mechanical Engineering, Purdue University, advancing to professor of Railway and Industrial Management and director of equipment research work. He resigned during the War to serve as assistant general manager of the Diamond Chain & Manufacturing Co., Indianapolis.

From 1921 to 1934, Mr. Wallace was executive secretary of the American Engineering Council, of Washington, and served on various Governmental, industrial and professional committees and advisory boards. In 1934-1935, he was vice president of the W. S. Lee Engineering Corp., engaged in the design and supervision of construction of hydro- and steam-electric plants. He was appointed Director of Equipment Research, Association of American Railroads on February 1, 1935.

A new train such as the Mercury of the New York Central System is not something that comes into full bloom some bright spring day as by magic. Into its sinews are woven the teachings of more than one hundred years of experience in railroad operations, the best thought of the engineers and scientists of yesterday and the courage and faith of men and management. Such a train is not mere sounding brass, but it is the substance of the best and most substantial thought of the past and the foresight of tomorrow.

Likewise this is true of the Zephyrs, the Comets, the Hiawathas, Green Diamonds, Four Hundreds, Royal Blues, Rebels and the others of that galaxy of new trains which have aroused the interest and admiration of the world.

Neither are they the end; rather they are the promise of better things yet to come. They are a promise and not a finis because the railroad industry has been and will continue to be a practicer and patron of applied research.

These trains are a manifestation of only one phase of the progressive efforts of the industry. They attract more attention than other accomplishments just as noteworthy because they come into more direct contact with the public. The public has not realized that at the same time that the new passenger trains were being developed the same character of experience, research and effort were being applied to developing like improvements in freight train equipment.

Experimental Equipment

THE Baltimore and Ohio has built and put into service thirteen experimental box cars. There have been used in the construction of these cars all of the newest and lightest metals suggested by the manufacturers as suitable for such service. These cars also embody in their construction the latest types of brakes, couplers, bearings, springs and other features. They illustrate the character of applied research on a large scale in the railroad industry.

The Pullman-Standard Car Manufacturing Co. recently built and tested two experimental freight cars, one a box car, the other a refrigerator car in the construction of which a light alloy metal and welding were extensively used. The objectives in building these experimental cars were to determine how much weight could be saved by the use of moderate cost alloy steel, without the sacrifice of any strength and without an undue increase in the cost of freight cars.

De Luxe Travel at Moderate Cost

THE Atchison, Topeka and Santa Fe recently put into service a new light-weight passenger car, the body of which is made of welded stainless steel. The car was built not only with the idea of achieving greater comfort, but with de luxe facilities for long distance travel.

To enumerate the long hours of applied research in the fields of metallurgy, car design, textiles and air-conditioning that have gone into the design of such modern freight and passenger cars would result in a staggering figure. Such is the price of railroad developments and improvements.

Anticipating Future Requirements

MODERN freight and passenger trains operated at such high speed and sustained schedules as now obtain, demand effective and reliable brakes. To provide them the Association of American Railroads, in anticipation of forthcoming demands, completed two years ago a research program conducted over a 10-year period and involving an expenditure of $2,800,000.

It required foresight to anticipate some twelve years in advance the coming demands. It required some courage and determined leadership to undertake a ten-year program at a cost of $2,800,000. Yet such is the fibre of the railroad industry, and because of this character of leadership the railroads of the United States have a record in 1935 of 18,000,000,000 passenger miles without one fatal accident.

The Pennsylvania Railroad is now operating daily some forty-four passenger trains between New York and Washington. These trains cover 225 miles in 225 minutes including four to eight stops. This all-electric operation was recently completed at an expenditure of over $200,000,000. Into this accomplishment went an untold amount of research relating to track construction, signal system, locomotives and numerous other matters.

As a part of the story leading to the above accomplishment, the Pennsylvania Railroad near Philadelphia equipped an experimental track upon which tests were made to determine certain fundamental data relating to track construction, signaling and electric locomotive design. The experimental equipment was such as to enable them to secure accurate data not previously obtainable. The rails were laid on steel ties and a pressure reading instrument was placed at the ends of every other tie. The instruments were so constructed that when the

(Continued on page 60)

Santa Fe Introduces New Passenger Car

A STAINLESS steel standard-size passenger car, the first of its kind built, put in service by the Atchison, Topeka and Santa Fe Railway Co., combines various light-weight structural features with advanced ideas for the safety, comfort and convenience of travelers.

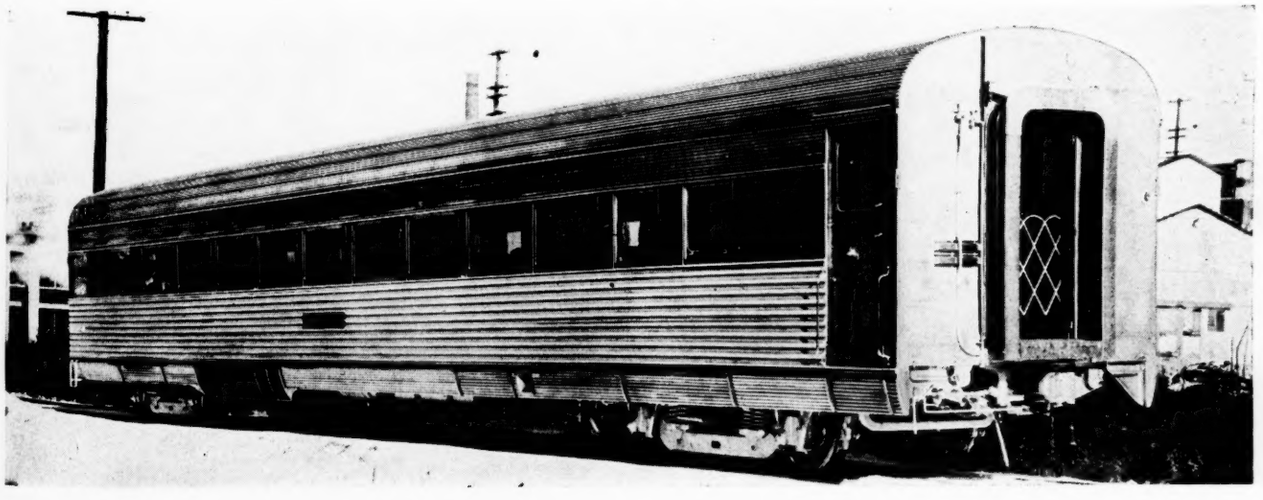
It weighs 83,000 pounds, of which 30,000 pounds are in the two trucks. A comparable conventional Santa Fe car weighs 160,000 pounds. Its low center of gravity insures greater safety and riding comfort at higher speeds.

While equal in size to a standard 80-passenger car, it has seats for only 52 passengers, the remaining space being devoted to spacious lounging rooms, comparable to those in Pullman cars.

The car is heavily insulated and air-conditioned. The widely spaced double seats are of the revolving and reclining type. The large windows are double panes of shatterproof glass with nitrogen hermetically sealed between them to prevent frosting and the collection of moisture.

Special features for riding comfort include hydraulic shock absorbers, rubber insulation, special wheel contour, and unit-mounted brake cylinders actuating clasp brakes.

The design of the car was developed by the engineering staff of the Santa Fe with the collaboration of the Edward G. Budd Manufacturing Co., in whose plant at Philadelphia, the car was constructed.



LIQUEFIED PETROLEUM GAS INDUSTRY

OUTPUT DOUBLED IN THREE YEARS

Butane and Propane Gas Service for Small Towns and Individual Industrial Users Provides New Fuel Source for Profitable Operations. Many Plants Being Established in the South.

As the motor vehicle and good roads made small communities more accessible to outside markets and as long distance transmission of electric power gave them opportunities for industrial advancement, so the development of butane and propane gas is allowing them to have access to gas fuel on an economical basis. Small towns can now secure gas giving them the advantages of large cities and areas which are supplied by natural and manufactured gas distribution systems. Isolated industrial plants are also enabled to use gas for power generation and in manufacturing operations.

Many small towns are installing butane or propane gas plants. They buy the gas in liquid form in tank cars, vaporize it in a comparatively simple and inexpensive plant and then distribute the gas through mains the same as natural or manufactured gas is handled by the larger public utility systems.

Not only are small communities provided in this way with gas service, but through the development of "bottled gas" isolated business and residential consumers can be served with this easily transported fuel.

Liquefied Petroleum Gases

Liquefied petroleum gases include propane, butane, pentane and propane-butane mixtures.

Propane and butane-propane mixtures are used mainly for supplying gas to consumers who are beyond the mains of companies supplying natural or manufactured gas. The gas in a liquid state is distributed to consumers in tank car lots and in metal cylinders, hence the name "bottled gas". The liquid, being released into the household system at atmospheric pressure, gasifies and is used in the same manner as ordinary gas supplied from gas-company mains. Bottled gas is used in suburban residences not within reach of gas mains, in farmhouses, in camps and summer homes, and in a variety of other places where its convenience and freedom from dirt and odor outweigh its higher cost compared with other fuels.

Advantages claimed are low cost per heat unit; clean high thermal value gas of uniform composition with no inerts, non-combustibles, sludge, or sediment; efficient combustion, burning with a uniform hot flame; low installation and operation cost; complete and accurate control; non-poisonous and safe, containing no carbon monoxide; and economical to distribute with small pipe lines handling any desired gas pressure.

The American Gas Association reported to the Bureau of Mines that at the end of 1935 liquefied petroleum gas was being delivered through mains to consumers in 163 communities in 29 States by 68 companies supplying 29,516 customers.

Sales, or the marketed production, of liquefied petroleum gases for domestic, gas company, and industrial uses, reached 76,855,000 gallons in 1935, or 36.2 per cent more than in 1934. The fast growing market is indicated in the accompanying table.

Substantial gains for the several liquefied gases included in the sales report indicate the rapid progress of the industry. Deliveries of propane increased 34.1 per cent in 1935 over 1934 and butane sales showed a rise of 33.4 per cent. The market demand for propane-butane mixtures nearly doubled and pentane gas sales increased.

The industrial use of liquefied gases was outstanding in 1935 when 47,894,000 gallons or 62.3 per cent of all deliveries fell under this classification. The domestic use of liquefied petroleum gases increased from 17,681,000 gallons in 1934 to 21,380,000 gallons in 1935. The quantity used in gas manufacturing increased from 6,298,000 gallons in 1934 to 7,581,000 gallons in 1935. The most important present use of propane gas is for domestic purposes, although the requirements in the industrial field are rapidly mounting. The use of propane gas in manufacturing increased from 10,283,000 gallons in 1934 to 15,628,000 gallons, or 50 per cent, in 1935.

Industrial Uses

Industrial and miscellaneous users consume a large proportion of the marketed production of liquefied petroleum gases. Manufacturers used both propane and butane in rapidly increasing quantities in 1935, in the solution of their heat application problems, especially in such processes as annealing, brazing, carburizing, metal cutting, and preheating, where controlled temperatures are important. Liquefied petroleum gases are being used as the raw material in the manufacture of an increasing number of chemical products. Among the growing industrial users are textile manufacturing operations, food processing, foundries, porcelain enameling, refining lubricating oils, fuel for internal combustion engines and switching locomotives, and air conditioning railway coaches with propane propelled refrigeration units.

Textile Manufacturing Applications

Modern gas appliances are available for use with industrial propane on all textile plant operations from laboratory to fin-

Liquefied Petroleum Gas Sales

Year	Propane Gallons	Butane Gallons	Propane-Butane Gallons	Pentane Gallons	Total Gallons
1932	15,182,000	14,662,000	3,417,000	854,000	34,115,000
1933	15,835,000	19,056,000	3,226,000	814,000	38,931,000
1934	25,845,000	25,553,000	3,107,000	1,922,000	56,427,000
1935	34,655,000	34,084,000	5,651,000	2,465,000	76,855,000

Marketed Production of Liquefied Petroleum Gases by Uses and Methods of Transportation 1935

Marketed Production of Liquefied Petroleum Gases by Uses and Methods of Transportation

	Propane Gallons	Butane Gallons	Pentane and propane-butane Gallons	Total Gallons 1935
By uses:				
Domestic	18,325,000	1,353,000	1,702,000	21,380,000
Gas manufacturing	702,000	5,042,000	1,837,000	7,581,000
Industrial and miscellaneous	15,628,000	27,689,000	4,577,000	47,894,000
Total 1935	34,655,000	34,084,000	8,116,000	76,855,000
Percent 1935	45.1	44.3	10.6	100.0
By method of transportation:				
Cylinders or drums	13,420,000	279,000	1,699,000	15,398,000
Tank cars, tank wagons and pipe lines	21,235,000	33,805,000	6,417,000	61,457,000
Total 1935	34,655,000	34,084,000	8,116,000	76,855,000

ishing processes, including both yarn and fabric applications. Space heating and small isolated boilers can use industrial propane efficiently.

Foundry Uses

Industrial propane gas is used for flame cutting and general foundry purposes including annealing castings, baking cores, melting non-ferrous metals, preheating electric furnaces, drying moulds, heating ladles, etc.

Porcelain Enameling

The world's largest continuous porcelain enameling furnace in the Leonard Plant of the Kelvinator Corporation, at Grand Rapids, Mich., which was installed by the Ferro Enamel Corporation, uses propane fuel. The gas, furnished by the Phillips Petroleum Company, lends itself readily to the requirements of the furnace.

Propane Gas Fuel in Food Industry

Industrial propane is now serving many of the nation's outstanding food companies. Bakers, especially, are finding the flames produced at the burners in the ovens result in a uniform roast or bake, and cereal manufacturers have been utilizing the advantages of liquefied petroleum gas as a fuel. The cooling produced during vaporization of the liquid may be utilized by means of suitable equipment for refrigeration or air conditioning.

Lubricating Oil Refining

The use of propane in lubricating oil refining is a matter of interest to the petroleum industry where several companies have installed commercial plants utilizing propane alone or in combination with other solvents in the following operations:

To de-asphaltize asphaltic or mixed- base residua.
To dewax residual or distilled oils.
As a diluent in acid and clay treating processes.
In combination with selective refining.

The source of the propane used in these processes is from tank car lots from liquefied petroleum gas marketers or produced in the user's refinery from still vapors.

Internal Combustion Engine Fuel

Propane gas produces a 125 octane engine fuel. It is said to have every desirable characteristic of gasoline when used in internal combustion engines, yet possesses additional advantages obtainable in no other existing motor fuel. It has a high anti-knock rating and permits the use of high compression ratios resulting in increased power output and an attendant decrease in specific fuel consumption.

Switching Locomotive Uses Butane Gas

The Plymouth Locomotive Works, division of the Fate-Root Heath Co., Plymouth, O., has developed a "new kind of locomotive." It is a butane-electric switching locomotive, upon which George Kirtley, assistant to the Vice President, has given special attention in the creation of their new power equipment. The Acme Steel Company, of Chicago, has had one of these locomotives in operation for some time. It is a 65-ton double-unit, electric-drive type powered by two butane-burning engines. Other installations include Plymouth butane and propane locomotives for the Pittsburgh Plate Glass Co., the Joplin-Pittsburgh Railroad Co., and the LaSalle & Bureau County Railroad Co.

Storage Equipment

For storage of liquid industrial propane at industrial plants when received in tank car lots, Phillips Petroleum Company recommends tanks of either 12,400, 15,000, 25,000, or 30,000 gallon capacity. The proper size and number of tanks for the storage system is determined by the quantity of industrial propane used, the time required to receive tank car shipments and the plant gas-load factor. The Ford Motor Company recently completed an installation of six propane tanks with a capacity of 30,000 gallons each in order to enrich its blast furnace gas.

Storage tanks located above ground on concrete foundations are preferred, although storage tanks may be located under ground if they are properly coated with suitable bituminous compound to prevent soil erosion, as well as properly weighted to prevent flotation where high ground water levels are prevalent.

The Phillips Petroleum Company also recommends that tanks for the storage of

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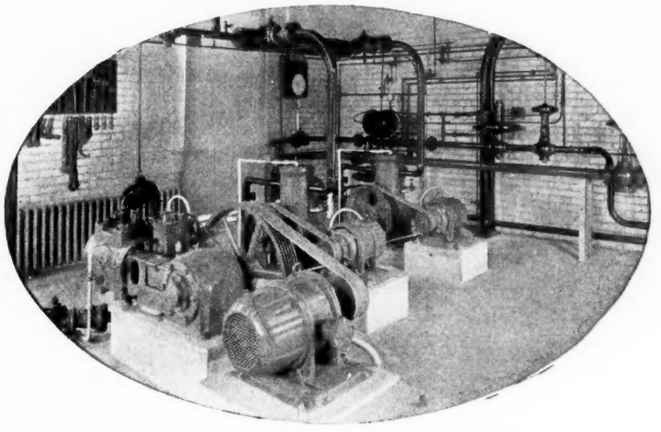
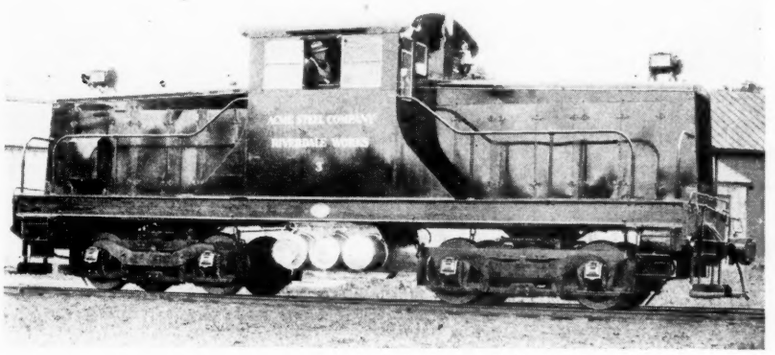
Municipal Butane Gas Plant at Andalusia, Ala.

Mixing Apparatus and Compressors in Butane Gas Plant, Troy, Ala.



New Type Butane-Propane Locomotive Made by Plymouth Locomotive Works



What's Ahead In NAVAL STORES?

By

Henry G. Knight,

Chief, United States Bureau of Chemistry and Soils

Dr. Knight has been Chief, Bureau of Chemistry and Soils, United States Department of Agriculture, since 1927. Director of Experiment Station and Dean of Agriculture of the University of Wyoming, Oklahoma Agricultural College and West Virginia University. Received training in chemistry and soils at the University of Wyoming, University of Chicago, University of Illinois and Cornell University. A.B. and M.A. University of Washington; Ph.D. University of Illinois. Writer of various published monographs on qualitative analysis; research work on potable waters, effect of alkali upon seeds, food adulterations, Wyoming forage plants, soil nitrogen, wool, poisonous plants, effect of alkali upon cement drainage experiments, digestion experiments, soil acidity, etc.

NAVAL stores mean turpentine and rosin.

They come from the gum of certain species of pine trees—the kind of pine trees that grow in the Southern States. For more than a century, the South has been the world's largest producer of naval stores. That's well known in the eight Southern States where pine trees are "farmed" for their "gum." What isn't so well known is that naval stores is a 40 million dollar crop, and that its products touch every home, and almost every person in the land. The industry employs about 50,000 people and pays them more than 15 million dollars a year in wages. The output for the 1935-36 season amounted to more than 2 and a quarter million barrels of rosin and over a half million barrels of turpentine, four-fifths obtained by "turpentining" more than 100,000,000 slash and longleaf pine trees, the other by "cooking" old pine stumps.

Naval stores is of national importance because its products are used in the manufacture of so many articles. It is important to the South because it employs many people, is an annual crop worth millions, and yields returns from lands that grow pine trees better than they do other crops.

In order of importance, the naval stores producing States are: Georgia, Florida, Alabama, South Carolina, Mississippi, Louisiana, Texas, and North Carolina. These 8 States produce about 65 percent of the world's supply of naval stores, and the industry ranks sixth as a farm activity in the States where it is produced.

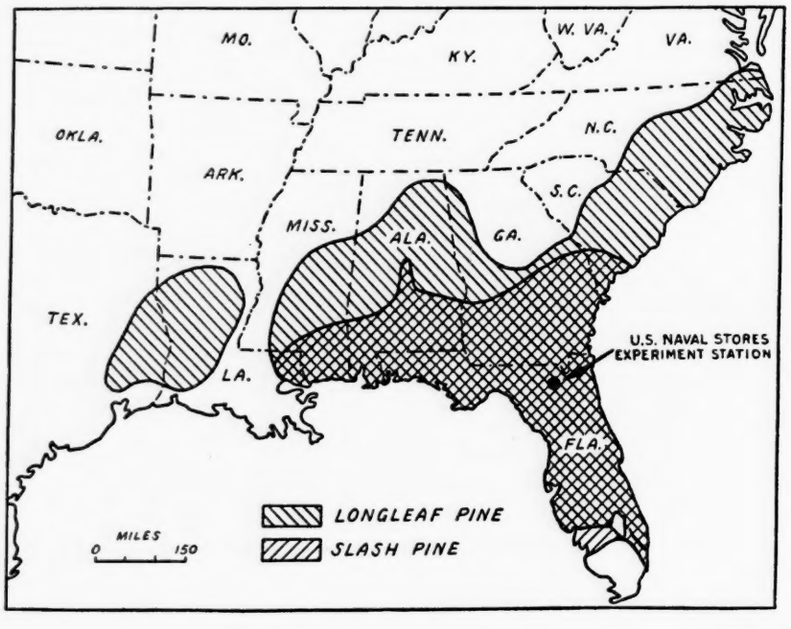
Naval stores is our most important export in the chemical field. More than half of the total production is exported.

Origin and Use

THE naval stores industry originated in Nova Scotia in 1606. It has changed its name from "turpentine farming" to "naval stores industry," and its original purpose from providing pitch and pine tar for calking ships to supplying rosin and turpentine for everyday use. The principal use of rosin is for sizing paper. Another major use is in making varnishes. Rosin gives soap desirable properties and prevents it from softening in warm weather. It's used in making printing ink. There's rosin in linoleum, in sealing wax, in rubber goods, greases, and insulating compounds.

The main use for turpentine is as a thinner for paints and varnishes. It's turpentine that gives shoe polish that characteristic odor. It serves as the raw material for making synthetic camphor, some synthetic perfumes, and finds use in various chemical and pharmaceutical preparations. Turpentine has a place in the medicine cabinet of almost every home in the land.

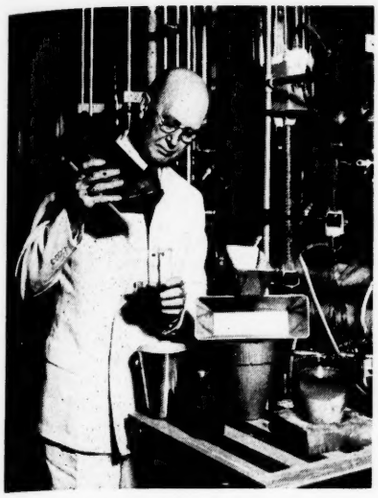
Southern Pine Areas



Naval Stores Experiment Station

BUT tremendous losses occur in the production of naval stores. It is estimated that one-fifth of the turpentine in the gum as it comes from the tree is lost before it reaches the consumer. This loss amounts to more than 2 million dollars a year. The loss in rosin is even greater. Producers of naval stores lose through inefficient methods something like 6 million dollars a year on a 40 million dollar crop, not including the loss of rosin caused by chips, trash, dross, nor the loss due to leaky barrels, storage, handling, and shipping. These losses occur in gathering and working after the farmer has incurred the trouble and expense of collecting the gum from the tree.

Chemists estimate that gum as it comes from the tree will make X grade or better rosin. But there are 12 grades below X on the market. The use of iron cups that discolor rosin has increased losses by lowering grades. So has poor equipment, and other things that



Dr. Knight showing how rusty cups discolor pine gum and lower the quality of rosin as much as 3 or 4 grades. The discolored gum he is pouring from rusty cup is compared with the lighter colored higher grade from the clear gum caught in the non-rusty glass cup at right. The cup problem in one of many the naval stores station is helping producers to solve

farmers have known about but could not correct because they had nowhere to turn for guidance, until Congress authorized the establishment of a naval stores experiment station where chemists could help solve their problems.

The first and only station of its kind in the country is located at Olustee, Florida, on the Jacksonville-Lake City Highway in the heart of the naval stores belt. It began operation September 18, 1932, less than 4 years ago, but its findings are putting new life into an industry that the depression and overproduction almost wrecked.

Value of New Findings

THE most recent finding in the naval stores work, and now being developed to a practical basis at the station, is a method for making, from ordinary gum, a rosin product that is 7 grades higher than the highest of the 13 American standard grades. It was obtained by separating gum into a number of liquid and solid fractions differing widely in their chemical and physical properties. From some of these fractions, products have been made which resemble rosin in appearance but differ from ordinary rosin in chemical properties. They are highly transparent, and much lighter in color than the best grade of rosin produced in this country, or the palest grade of French bleached rosin. These new rosin-like products differ chemically. The lighter colored ones consist almost entirely of the more stable acids, which are less subject to change by oxidation, and therefore more valuable than ordinary rosin for the

(*Continued on page 62*)

Naval Stores

ONE of the oldest industries of the South is the production of rosin and turpentine which had its beginning in Colonial days with the development of a demand for pitch and pine tar for calking ships. With the dwindling of the one-time impressive fleet of wooden ships, new developments and new uses have continued to create demand for these forest products, making naval stores the sixth farming activity in the South and of importance in our export trade.

Eight Southern States produce about 65 per cent of the world's supply of naval stores. They represent an industry with an annual output of turpentine rosin and by-products valued at approximately $40,000,000, providing employment for 50,000 persons who receive more than $15,000,000 a year in wages.

About 2,276,000 barrels of rosin and 602,000 barrels of turpentine were produced by the naval stores industry in the 1935-36 season.

Turpentine and Rosin Output by States

	Gum Rosin Barrels (500 pounds)	Gum Turpentine Barrels (50 gallons)
Georgia	909,407	275,450
Florida	466,929	141,416
Alabama	160,450	45,637
South Carolina	53,716	16,697
Mississippi	32,271	10,045
Louisiana	15,311	4,733
Texas	5,657	2,066
North Carolina	3,259	956
Total	1,647,000	497,000

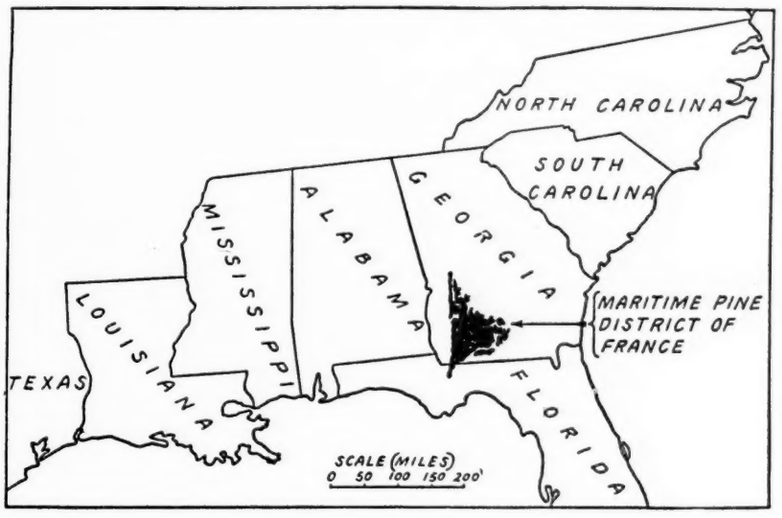
Scattered throughout the naval stores producing regions of the South, are small local turpentine stills, while large wood distillating plants utilizing pine shavings, stumps and topwood are in operation at many concentration points. Such enterprises require in their construction the latest developments in equipment, piping, tanks, extractors, stills, evaporators, etc., for the manufacture of wood, rosin, steam distilled turpentine, pine oil, disinfectants and a long and growing list of by-products.

With a pine forest land area of 150,570,000 acres and increasing interest in reforestation and fire protection, the South can continue to supply the bulk of the world's naval stores requirements.

Also, furnishing as it does 43 per cent of the lumber cut of the United States and capable of producing our pulp and paper needs, developments of which are making rapid progress, the forest resources of the South are one of its greatest assets.

Editor, MANUFACTURERS RECORD

Darkened area drawn to scale on the Southern States represents Maritime pine district of France, our nearest competitor in the production of naval stores



Demand Increasing for FURNITURE

Unusual Opportunities for Expansion of Production Through Modernization and Replacement of Obsolete Machinery and Methods to Meet Nation's Needs

By
Dr. A. P. Haake,
Managing Director,
National Association of Furniture Makers

DR. HAAKE was graduated from Wisconsin University, where he subsequently taught economics, later directing the economic's department at Rutgers College. He headed a bureau of industrial economics for a Detroit advertising firm, acted as sales analyst for firms in the automotive industry, and was director of research for a nationally known bed and mattress manufacturer, later being elevated to direct sales, advertising and service.
In 1928, he promoted organization of the National Association of Furniture Manufacturers and has since served as its managing director, besides holding the same position for the National Jobbers Association. As a member of the executive committee of the Furniture Code Authority, he spent considerable time in Washington in behalf of the industry, appearing in hearings and endeavoring to curtail Government competition with private enterprise.

CONFIDENCE is *asking* to be restored, and even refusing to wait for conditions which completely justify its restoration.

Unemployment has been shrinking, in spite of the addition of thousands of new workers to the labor market. While no one knows exactly how many persons are out of work, it can safely be said that the number is decreasing. There is increasing evidence of difficulty in getting labor of various sorts, particularly skilled help, which points to continuous improvement in industrial and commercial conditions. Even legislation and the uncertainties created in and by Washington have been unable to stop the improvement.

The basic industries show improvement. The building industries, where high wage rates and more or less rigid control by unions have been artificially holding up the cost of construction and holding back the program of home restoration, are increasingly active. Just how much better off the highly organized workers in the building industries would be if they would accept lower hourly rates and more wages, cannot definitely be demonstrated, but a more reasonable policy on the part of the building trades unions would give the men substantially more annual income and provide homes at more reasonable cost for many more people. It would be the story of everyone benefitting by a broader market.

Naturally, any improvement in building is bound to affect the furniture industry favorably. It is axiomatic that increases in building of homes are followed by corresponding improvements in the furniture industry, anywhere from six months to a year following.

It is safe to predict that building in 1936 will be at least double what it was in 1935, and that the furniture industry, toward the end of 1936, should feel the beneficial effect of the increase. For the next ten years we shall have to build an average of at least 400,000 new homes a year to catch up with our actual needs. This would be more than double the number of homes expected for 1936, and promises well for our industry.

Consumers have been postponing the purchase of needed new furniture; cheap furniture, bought during the depression period, must soon be replaced; homes are being re-integrated; new couples are being married; children are being born, and altogether there has been built up a substantial backlog of unsatisfied demand which will help our industry as purchasing power becomes more effective.

Changing Furniture Styles

In addition, styles in furniture are changing so much that, except for the high grade furniture now in use, much, perhaps most, of it now in use is becoming as distasteful as a 1926 motor car. The magazines and newspapers have done splendidly in making women more aware of beauty in the home. Consumer taste is actually developing more rapidly than selling ability. This applies particularly to furniture. As the manufacturer and dealer improve their knowledge of consumer needs and desires, and key themselves up to the task of better making and selling, the furniture industry will be given additional impetus.

There can be no question but that the need for furniture and the growing appreciation of its place in beautiful and comfortable homes, with the other factors that are at work, are creating an expanding market for our product. The potential sales are there for an industry of at least twice our present capacity.

But on the producing side we have much progress still to make. In many respects we are still a backward industry. Years ago I coined the term "bench-graduate" as characteristic of most manufacturers. By it was meant, men who were honest and able craftsmen, many of them coming up through the factory, literally from the bench, to become furniture manufacturers. They learned how to make furniture as craftsmen, but have still to learn the art of producing furniture on a mass basis.

While it is not anticipated that furniture will ever become a mass-production industry in quite the same degree as some others, nevertheless the realization cannot be avoided that we must go much further in the use and adaptation of machinery to lower the cost per unit of value in furniture if we are to compete continuously and successfully with other industries that are not waiting to be forced into efficiency.

Better and More Machinery Needed

There is great need for better and more machinery in many of our plants, need for better and more efficient production methods, and those of us who fail to meet the challenge will simply take our places in the procession of those who retire from the industry. The volume of furniture produced annually will unquestionably increase sharply, but there will not be a corresponding increase in the number of factories.

A number of factories are already gearing themselves to the greater challenge. The opportunity for others to do so will not wait indefinitely!

Costs of furniture have already risen and will rise higher. The social security costs are beginning to be felt. Lumber prices have already increased and will go still higher. The price of many other materials entering into the product will be boosted. The need to hold costs down can be met only by more efficient use of the more expensive labor and materials and equipment.

The improvements will not be effected immediately in sufficient degree to prevent the price of furniture from moving upward. Then, too, there is imperative

need for profit if the industry is to continue, and there is no doubt but that wholesale prices of furniture will go higher during the present year. This will be a real boon to all elements in the industry and trade.

Profit Motive or Political Preferment

The usual "presidential year" influences will be felt, of course, but probably less than in other presidential years. The writer happens to believe, and offers it only as his opinion, that the election will be followed by a measure of stability, and that the election of a candidate pledged to restore business methods to the administration, balance the budget, rationalize the national fiscal policies, and recognize profit as respectable, is likely to instill more confidence on the part of business than is the election of a candidate who makes promises only as a means to get votes. Let the business world know that profits have a chance to survive, can safely be ploughed back into a business, that it is safe to make additional investments, expand production and increase employment without turning management over to labor organizers, that we shall move definitely toward a clear and sound monetary policy and stop increasing the national debt, and capital will come out of its present hiding, or temporary purgatory in government bonds, and go to work in producing goods and employment.

We are moving out of the depression, in spite of frantic efforts to make reform a pre-requisite to recovery. Could we have given our whole attention to the relatively simple problem of getting out of the depression, and been in agreement on the fundamentals, we should by this time have passed England and other countries on the road to recovery. But we did not attack our problem in its real essentials.

The depression gave an unprecedented opportunity to well-meaning theorists who have long been yearning to "try out" their panaceas. The land swarms with self-appointed Messiahs and economic chiropractors who, knowing little, talk glibly to those who know less, and have succeeded in thoroughly confusing the American mind as to what it is all about.

Business men have kept their noses so close to the grindstone that they have failed to realize their opportunity and responsibility. So, between all of us, we have done a first class job of drifting into a beautifully muddled situation.

For me, the issue comes to two broad questions: Shall we have government by men or government by law, and, shall the motivating urge be profit or political preferment? It is my opinion that the answer to those two questions will determine the fate of America. The answer to those questions will determine our practical attitude on regimentation, the degree of power centralized in Washington, the fate of the Supreme Court, the character of our homes, the measure of individual freedom that will remain or become ours, whether or not it will be profitable and worthwhile to remain in business. I would go further and say even that the answers to those two questions will determine whether, like ancient Rome, we let our civilization crash and begin all over again, or whether out of the crumbling concepts of our time we can proceed to the full culmination of what has been called the capitalistic system.

Those are questions which the average business man may deem beside the point as he considers the problem of packing a dresser to avoid damage in transit, but they are questions which must be answered before the business man is safe in depending upon the pursuance of his present ventures.

It is my belief that we must have government by law, and that we cannot afford to jeopardize all that is precious to us in exchanging the profit motive for that of political preferment.

However, I do have faith in the fundamental reasonableness of our people, and am inclined to say to the business man. "Be of good cheer, continue the good fight, and good shall come to you."

We can have an excellent industry, if we will!

Southern Furniture Plant Scenes

Furniture Making In South Expands

GROWTH of the furniture industry in the South has been over five-fold in the past 30 years. Its continued expansion and modernization of facilities and products have brought the production of its more than 400 furniture factories to approximately $100,000,000 a year in normal times and they expend $50,000,000 annually for materials and power. In the depression year 1933, they paid out nearly $17,000,000 in wages when their production was valued at $70,752,000.

The South leads the nation in the production of wood and household furniture. Factories in two Southern States, North Carolina and Virginia, produce nearly one-half of the bed room and dining room furniture.

The South's furniture making industry has been developed on abundant forest resources. It has 55 per cent of the hardwood timber stand of the United States and is now supplying over 70 per cent of the domestic hardwood consumption of the country. With 38 per cent of the commercial forest area, and producing 58 per cent of the saw timber growth, 43 per cent of the country's lumber cut is from the South.

Steady improvement in furniture demand has increased activity. The volume of furniture manufacturing in 1935 showed a 30 per cent gain over 1934 and was comparable with 1931 when the output was valued at $96,705,000. With greater increase in residential building this year and replacement demand growing furniture consumption is getting back to the pre-depression volume.

Editor, MANUFACTURERS RECORD

Metered Parking

Public Reception Generally Favorable to Use of Slot Machine Timing Device for Control of Street Parking in Congested Areas

ORIGINATING last July in Oklahoma City, the nickel-in-the-slot parking meter is being tried out in a number of cities as a step towards relieving street traffic in congested zones.

The device measures the length of time a motor vehicle is parked at the curb. An hour is the customary period and 5 cents the time-unit charge. The motorist places a coin in the meter and sets the clock-like mechanism which raises a flag for the time permitted. At the end of the time the flag drops and the policeman, by observing the meters, can spot the cars parked overtime.

Obviously, adoption of this method of controlling street parking still leaves unsolved the main problem of handling moving vehicles on congested streets. Objections have been raised by motorists who contend that it is but another added tax burden. City ordinances authorizing the use of meters have been attacked in courts. Reports from cities that are giving the parking meter plan a trial, indicate favorable results have been obtained.

Cities using parking meters are Oklahoma City, Dallas and El Paso, Texas, St. Petersburg and Miami, Fla., with Kansas City, Mo., and Houston, Tex., just putting them into operation.

O. M. Mosier, City Manager of Oklahoma City, where the meters were first installed, declares that the success of the initial installation of 174 meters was so obvious that 354 have since been added. The daily revenue now averages approximately $210. All parking meter zones are one-hour with the exception of the areas around the banks where the time is limited to 30 minutes. The fee is 5 cents for all zones.

The police are favorable to this form of traffic control says Mr. Mosier, because parking periods are properly timed and streets are kept much clearer for traffic, especially from 7 to 9:30 in the morning. Merchants have also accepted the meters favorably. No loss in business has been indicated. While meters were first located only on one side of streets, the merchants requested their installation on both sides. Reaction of the motoring public has been favorable. On the busiest streets the metered spaces are occupied practically all the time. However, it is not difficult to find a parking space as there is a rapid turnover. Traffic congestion has been relieved since it is not necessary to cruise in search of parking spaces. All meters are spaced 20 feet apart, giving ample room to get in and out quickly and without crowding.

The meters have been installed under the police powers granted cities through the Oklahoma Constitution. The fees are levied and collected by the city and apportioned to its general fund. These fees no more than pay for policing, regulating, cost of meters, servicing, collecting and handling of money and the construction, maintenance and daily clearing of parking areas. The City Manager asserts that about 8 per cent of the collections on parking meters is required for the extra expense occasioned by them, but the total policing cost slightly exceeds the receipts. This latter cost includes everything that can be allocated against the cost of regulating traffic in the metered zones.

Dallas, Texas, purchased 1,000 meters, 300 of which were placed in operation November 4 and the remainder installed before December 10. These meters proved entirely satisfactory, says Hal Moseley, City Manager, who asserts they have met with the general approval of merchants, professional men and the average motorist. Through this system of control double parking has been eliminated and the traffic flow improved in the metered area. Parking space—a 20-foot zone for each meter—is said to be available at any time of the day within a convenient distance from any desired location.

The advantages of the original installation of 1,000 meters were so great that the City Manager says that an additional 500 meters were installed at the request of merchants in the area adjoining the original installation. In addition to the traffic relief afforded by this method of control there is made available a source of income which at present amounts to approximately $500 a day gross revenue.

Gross Revenue and Operating Costs—Dallas, Tex.

(Includes collections, maintenance and other work in marking of metered zones)

Month	Number Meters	Gross Revenue	Operating Cost
January	1,000	$9,477.50	$785.57
February	1,000	8,877.96	755.17
March 1-24	1,000	11,109.45	785.82
March 25-31	1,500		
April	1,500	12,906.45	973.10

El Paso, Texas, installed 500 parking meters on January 1 at a cost of $58 each. The purchase price is being paid out of the receipts of the meters. Receipts to May 5 totaled $11,222. 58 per cent of this amount going to the company supplying the meters and the rest to the city.

Considerable opposition from various groups, including merchants, was experienced when the meters were first installed, states W. R. Collins, City Clerk of El Paso. But he reports motorists, business interests and the general public now favor the meters, and the police are "for them to a man." Mr. Collins believes this is the modern way to handle parking problems in the cities.

L. L. Lee, City Manager of Miami, Fla., reports the meters have been generally accepted by the merchants, business and professional men in the city and there has been a decided improvement in double parking and traffic conditions. A recent check shows an approximate income of 50 cents per meter per day.

St. Petersburg's experience with parking meters has been highly satisfactory, says Mayor John S. Smith. Naturally when the new device was first proposed it became immediately a subject of city-wide discussion and like all new ideas it had its share of objectors. When the first installation was planned some merchants objected to having them placed in front of their stores, but since that time a number of merchants have especially requested the installation of machines.

Some cities, however, have rejected proposals to install such devices and no doubt the controversy will continue as to the merits or demerits of a system of special taxes for street parking privileges. In this connection, the District Court of Oklahoma County has declared that "parking is a privilege, not a right, and that Oklahoma City had sufficient authority to regulate parking by means of the meters."

The initial installation of 1,000 meters costs approximately $58,000. Taking an average of 50 cents a day earning per meter, 1,000 meters would earn $500 a day, or approximately $182,500 a year. In the first year a city is supposed to recoup the cost and earn approximately $124,500, exclusive of supervision costs as might be charged to them.

Estimating it would take at least 1,000,000 meters to serve the business district of American cities, the cost to motorists would be between $175,000,000 and $200,000,000 a year.

44,000,000 People in the Southern States

Only Seven Countries out of 300 in the World Have a Larger Population

223 Southern Cities Have More Than 10,000 Inhabitants Each

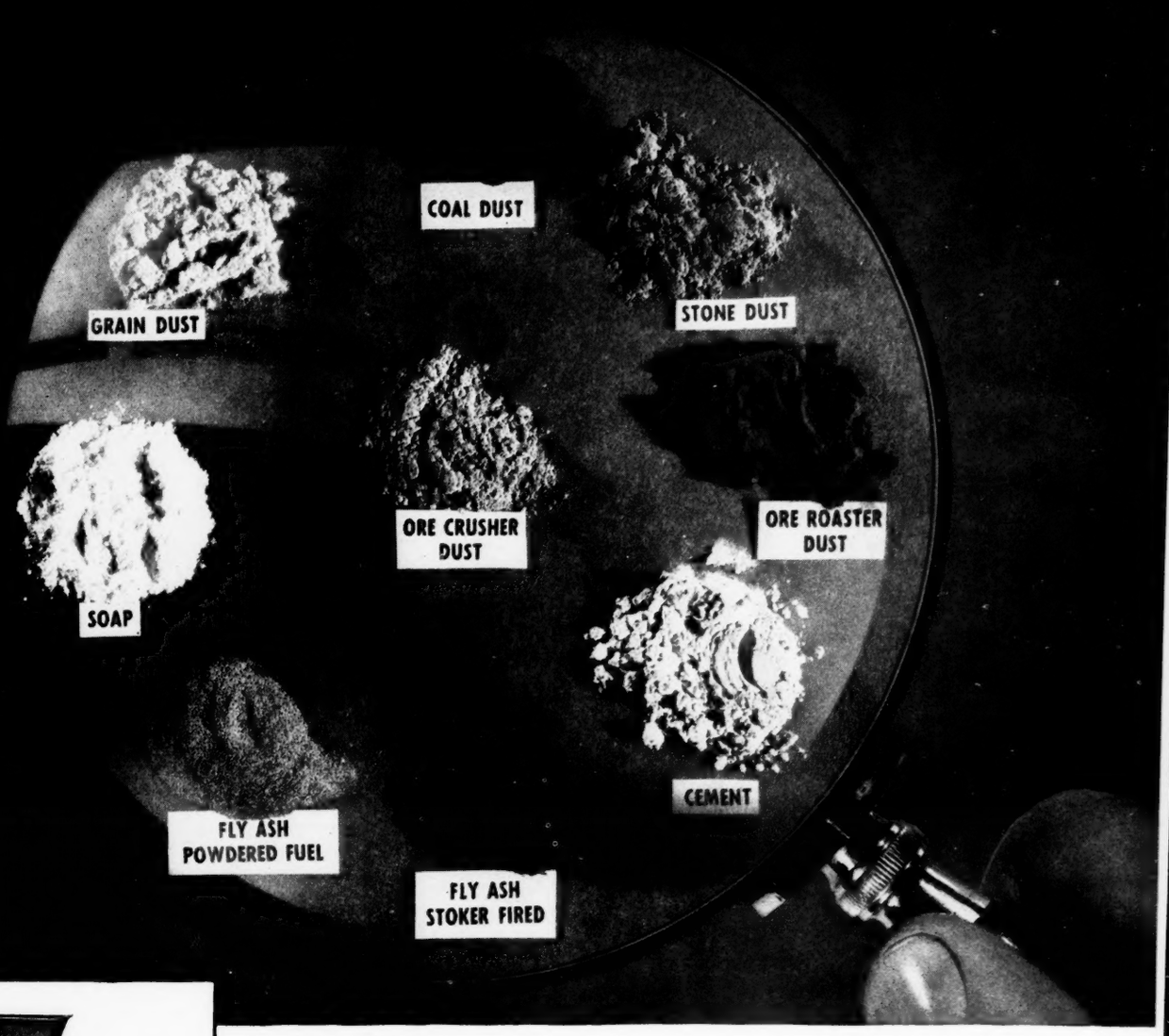
THE population of the 16 Southern States is now more than 44,267,000, according to recent estimates by the Census Bureau which places the number of inhabitants of the entire country at 127,521,000.

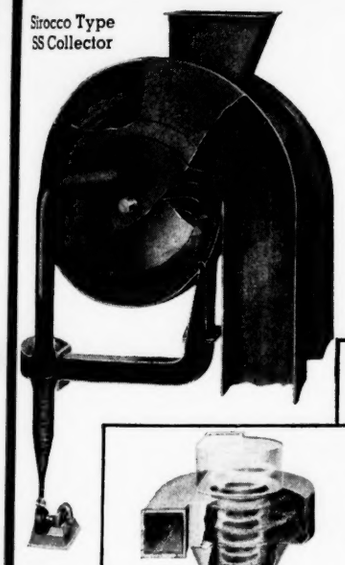
More than 34 per cent of the people of the United States live in the South. The gain in population in the South since the general census of 1930 is 3,019,000 persons.

Within the Southern States now reside almost as many people as were in the entire United States in 1880.

In fact, only seven countries—China, Dutch East Indies, Germany, British India, Japan, Russia and the United Kingdom—out of more than 300 in the world have a larger population than the South. Except Germany and Russia, the South has a larger population than any country in Europe. It has more people than any country in Central and South America and four times the population of Canada.

Population estimates show that the South has 223 municipalities each with 10,000 inhabitants or more. Alabama has 14 such cities, Arkansas 9, Florida 14, Georgia 15, Kentucky 13, Louisiana 8, Maryland 6, Mississippi 13, Missouri 16, North Carolina 21, Oklahoma 16, South Carolina 9, Tennessee 8, Texas 36, Virginia 14, West Virginia 10 and the District of Columbia 1.





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Grain dust from Albany—coal dust from Quebec—stone dust from Cincinnati—ore roaster dust from British Columbia—cement from Detroit—stoker-fired fly ash from Philadelphia—powdered fuel fly ash from Chicago—soap from Cincinnati—ore crusher dust from Michigan—all actual samples collected by Sirocco Collectors in daily operation in different industries. In each of these installations and many others, American Blower Engineers have cooperated with plant engineers to find the most economical and satisfactory means of collecting material from air. If you have a dust problem, whether it involves relieving a nuisance or collecting valuable materials, call in an American Blower Engineer. He will give you complete data on Sirocco type D, type SS and type ST collectors and cooperate with you in the practical and economical solution of your problem. Phone or write today.

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$506,000,000 CONTRACTS LET

Seven Months' Total Construction Awards in South 83 Per Cent Above Last Year and Set Six-Year Record. Largest for any July Since 1930.

CONSTRUCTION contracts, aggregating $83,144,000 in July, are the highest reported by the South for any seventh month with the exception of July, 1930.

With the July awards, a total of $506,449,000 of new building, engineering and construction projects was let to contract in the Southern states during the first seven months of 1936, setting a six-year record.

Compared with $275,837,000 of contracts awarded in the corresponding period of 1935, the awards to August 1 of this year show a gain of 83 per cent, the increase being $230,612,000.

The seven-month total this year is within $3,425,000 of equalling the entire twelve-month total of 1934, and is but $110,876,000 less than the 1935 total of $617,325,000.

Industrial Expansion Widespread

Considering the July total, industrial and engineering projects head the list of major classifications with awards aggregating $24,584,000, of which $11,462,000 was for purely industrial construction. The industrial total assumes added significance when it is considered that the only major project let to contract last month was the $2,750,000 extension to the not yet completed $4,000,000 pulp, paper and bag plant of the Union Bag & Paper Corp., under construction at Savannah, Ga. A wide variety of miscellaneous industrial enterprises, including new and expanding plants, involving outlays of from $25,000 to $75,000 make up the impressive total.

Road, street and paving awards last month ran to $22,000,000. General building operations rank third in July with $18,395,000 of contracts let. Public buildings involving $18,155,000 were placed under contract in July.

Housing Operations Feature Current Activities

The award of contracts for the superstructures of housing projects financed by the Federal Government featured building activity in the South last month. Together with privately financed dwelling construction, a total of $12,623,000 in awards was rolled up, the highest figure of record for a single month's residential awards.

With low bids now under consideration on like housing projects and awards scheduled to be made shortly, added emphasis is to be given to the residential construction field in the Southern states.

Operative builders are becoming increasingly active in Southern towns and cities. Meanwhile, there are being built under contracts let by owners, thousands of houses costing $2,000 to $8,000, no total cost figures for which are available since space limitations preclude publication of such items. Also, an increase is noted in the number of costly residential properties put under way, some recent awards having involved outlays of more than $150,000 for single projects.

Varied Lines Show Accelerated Pace

The substantial investment in the aggregate being made in comparatively small and widely scattered industrial enterprises claims the spotlight in the construction industry in the South. From Maryland to Texas, in rural communities and in bustling cities, new industrial plants are being reared. In addition to the substantial investment represented by recent awards, the volume of projected new ventures is increasing with accelerated vigor.

Louisiana sugar plants long idle are being rehabilitated. Southern transit lines are investing heavily in new rolling stock including the latest offerings of electric trolley makers and the builders of the most modern motor buses, resulting in the modernization of shops and barns. Utilities companies are concentrating on the extension of power lines to serve rural areas. The railroads are buying new rolling stock for freight and passenger business, laying new rails and accessories and modernizing shop equipment. Long distance bus line operators are buying fleets of new buses, building garages and shops and erecting terminals replete with modern facilities for the comfort of the traveling public. Truck terminals too are being built by leading operators.

A Baltimore oil refinery has started a $200,000 expansion program. A Paducah, Ky., oil plant is spending $100,000 for improvements and a like program at a Houston, Tex., refinery involves $200,000, while a pipeline from the important Texas City

(*Continued on page 42*)

SOUTHERN CONSTRUCTION ACTIVITY

	July, 1936		January-July, 1936	
	Contracts awarded	Contracts to be awarded	Contracts awarded	Contracts to be awarded
General Building				
Apartments and Hotels	$ 2,315,000	$1,021,000	$16,502,000	$14,315,000
Association and Fraternal	61,000	1,287,000	470,000	2,540,000
Bank and Office	328,000	420,000	3,063,000	2,323,000
Churches	358,000	685,000	1,877,000	4,970,000
Dwellings	12,623,000	1,861,000	33,137,000	15,365,000
Stores	2,710,000	2,186,000	9,047,000	11,842,000
	$18,395,000	**$7,460,000**	**$64,096,000**	**$51,355,000**
Public Buildings				
City, County, State and Federal	$13,701,000	$18,794,000	$77,052,000	$127,876,000
Schools	4,454,000	6,347,000	36,696,000	53,417,000
	$18,155,000	**$25,141,000**	**$113,748,000**	**$181,293,000**
Roads, Streets and Paving	**$22,010,000**	**$37,556,000**	**$141,594,000**	**$208,214,000**
Industrial and Engineering				
Drainage, Dredging and Irrigation	$ 7,241,000	$ 8,287,000	$ 12,501,000	$ 90,619,000
Filling Stations, Garages, etc.	539,000	305,000	2,891,000	4,130,000
Industrial Plants	11,462,000	25,689,000	136,948,000	268,232,000
Levees, Revetments, Seawalls, Dikes, etc.	3,279,000	4,455,000	9,672,000	13,323,000
Sewers, Drainage and Waterworks	2,063,000	7,862,000	25,049,000	52,348,000
	$24,584,000	**$46,598,000**	**$187,061,000**	**$428,652,000**
Totals	**$83,144,000**	**$116,755,000**	**$506,499,000**	**$869,514,000**

OVERSEAS TELEPHONE RATES REDUCED

Reduced week-day rates for telephone calls to Europe, South America, Central America, Hawaii, Philippine Islands and the Caribbean Islands are now in effect. There are also new Sunday rates to these same countries.

This is the third reduction in Overseas telephone rates since 1927—and service has been constantly improved. The cost of a three-minute telephone call from New York to London or Paris, for example, is now only $21 during week-days and $15 at night or on Sunday. (See the rate table at the right.)

NEW OVERSEAS RATES

NEW YORK to	Previous Week-day Rate	New Week-day Rate	New Sunday Rate
London	$30	$21	$15
Paris	30	21	15
Buenos Aires	30	21	15
Rio de Janeiro	30	21	15
Berlin	33	24	18
Honolulu	30	24	19.50
Manila	39	30	24
Panama City	21	12	9
San Juan, Puerto Rico	18	12	9
Guatemala	21	12	9
Bogota, Colombia	24	15	10.50

• Night rates (5 P.M. to 5 A.M.) are also in effect to European points and are the same as the Sunday rates.

Just call Long Distance and ask for the Overseas operator.

• Above rates effective from most cities on the Atlantic seaboard. Rates from other points in the United States vary according to the distance involved.

The new Overseas telephone rates bring offices abroad closer to headquarters—make it still easier to deal directly, personally, with foreign representatives or customers.

AUGUST NINETEEN THIRTY-SIX

$506,000,000 Contracts Let

(*Continued from page 40*)

costing $400,000 is under way. A new oil plant at Quanah, Tex., calls for an outlay of $300,000, while $100,000 is being put into an oil plant improvement program at Gulfport, Miss. Two plants to cost $100,000 each have been let to contract at Kermit, Tex.

Other contracts let during July provide for a $100,000 coal tipple at Rivesville, W. Va., a $100,000 drum making plant at Houston, Tex., a $180,000 sugar mill for Minerva, La., a $130,000 grocery plant in Washington, D. C., a $142,000 power project in Norfolk, Va., and a $150,000 can plant in North Kansas City, Mo.

The American Can Co. is considering establishment of a plant to cost $1,000,000 at Houston, Tex.

The Continental Can Co. will shortly begin work on a $500,000 can making plant, warehouse and office building in New Orleans, La. The Tubize-Chatillon Corp., of New York City, proposes extensions to a rayon plant at Rome, Ga., and a weaving mill at Hopewell, Va., estimated to cost $2,800,000. In Texarkana, Ark.-Tex., a $1,200,000 gas system is projected.

Some Representative Projects In The South Last Month

Proposed Construction

Ala., Birmingham—U. S. Housing Administration
Superstructure of Smithfield housing project $2,500,000

Ark., Little Rock—City
1,500,000 cu. yd. earth fill dam for waterworks; Burns & McDonnell Engineering Co., Cons. Engrs., Kansas City, Mo. 1,250,000

D. C., Washington—District Commissioners
Police court building; Nathan C. Wyeth, Archt. 1,500,000

Ga., Atlanta—Montgomery Ward & Co., Chicago, Ill.
New building 3,000,000

Ga., Decatur—Southern Bell Telephone & Telegraph Co., Atlanta, Ga.
Telephone central office 820,000

Ga., Rome—Tubize-Chatillon Corp.
Improvements to Hopewell, Va., and Rome, Ga., plant.... 2,800,000

Ky., Lexington—City
Complete waterworks system; J. S. Watkins, Cons. Engr. 3,400,000

La., Abbeville—Vermillon Parish Police Jury
Addition to court house; Claude H. Lindsley, Houston and O. J. Southwell, New Iberia, La., Archts. 300,000

La., Jonesboro—Jackson Parish
Court house; H. H. Land and Curtis Smith, Monroe, La. 150,000

La., Livingston—Livingston Parish
Court house and jail; William R. Burk, Archt. 150,000

La., New Orleans—City
Yacht basin; Richard Koch, Archt. 250,000

La., New Orleans—Continental Can Co., Inc., New York City
Construction program; Favrot & Reed, Archts. 500,000

La., Shreveport—City, T. L. Amiss, Supt. Waterworks
Improvements to water and sewer systems 265,000

La., St. Martinsville—St. Martin Parish
Court house improvement; Favrot & Reed, New Orleans and F. J. Nehrbass, Archts. 100,000

Mo., Village of Ladue
Sanitary sewers; W. W. Horner, Cons. Engr., St. Louis, Mo. 425,000

N. C., Pembroke—Resettlement Administration
Acquired 10,000 acre tract in Robenson County for development 1,000,000

N. C., Raleigh—Edinton Methodist Church
Memorial Building; Atwood & Weeks, Raleigh and Henry E. Tralle, New York, Contrs. 125,000

S. C., Charleston—City
Waterworks tunnel 1,000,000

S. C., Greenwood—Greenwood County Finance Board
111 miles rural electrification lines 106,000

Tenn., Memphis—Union Planters National Bank
Addition; Hanker & Cairns, Archts. 100,000

Tenn., Memphis—Armour & Co., Chicago, Ill.
Enlarge packing plant; Henry J. Kramer, Asso. Archt... 100,000

Tex., Corpus Christi—Morris L. Levy
Theatres and stores 100,000

Tex., Dallas—Municipal Aviation Board
Lovefield airport improvements 500,000

Tex., Dallas—Methodist Publishing House
New plant; Mark Lemmon, Archt. 150,000

Tex., Gainesville—Board of Education
Junior High School; Elmer C. Withers Architectural Co., Inc., Fort Worth, Archts. 165,000

Tex., Houston—Houston Independent School District
University of Houston Junior College; A. C. Finn, Lamar Q. Cato and Harry Payne, Asso. Archts. 200,000

Tex., Houston—American Can Co.
Propose new plant 1,000,000

Tex., Houston—Union Carbide & Carbon Co.
Petroleum by-products plant 6,000,000

Tex., Port Arthur—Port Arthur Independent School District
Junior High School; Mark Lemmon, Dallas, Archt..... 400,000

Tex., Wichita Falls—State Board of Control, Austin
Psychopathic Hospital; Voelcker & Dixon, Inc., Archts. 125,000

Va., Norfolk—U. S. Navy Department
Norfolk Navy Yard improvements 1,000,000

Va., Norfolk—Prest-O-Lite Co., Inc., New York City
Branch plant 200,000

Va., University—University of Virginia
Library; R. E. Lee Taylor, Baltimore, Archt. 950,000

Contracts Awarded

Ala., Birmingham—City Commission
Pipe for industrial water supply; Chicago Bridge & Iron Works and Ingalls Iron Works, Contrs. $984,000

Ark., Fort Smith—Treasury Department
Post office; James I. Barnes, Logansport, Ind., Contr. 292,000

Ark., Little Rock—City
32-mile pipeline; Lock Joint Pipe Co., Ampere, N. J., Contr. 1,561,000

D. C., Washington—A. A. Eckles and K. H. King
Office building; Skinker & Garrett, Contrs. 100,000

D. C., Washington—Sanitary Grocery Co.
Warehouse; Charles H. Tompkins Co., Contr. 130,000

Fla., Fort Lauderdale—George T. Kitterige, Detroit, Mich.
Precooling plant 100,000

Fla., Fort Pierce—War Department
Dredging at Fort Pierce; Clark Dredging Co., Miami ... 160,000

Fla., Miami Beach—M. W. Alworth
Dwelling, garage and servant's quarters; Fred Howland, Inc., Contr. 200,000

Fla., Miami Beach—Astor Hotel
New building, 69 rooms; L. & H. Miller, Contrs. 150,000

Fla., Miami Beach—Elvor Realty Co.
Sixty-two room hotel; Prufert-Wein Construction Co., Contrs. 100,000

Ga., Savannah—Union Bag & Paper Corp.
Additional machine and auxiliaries; Merritt-Chapman & Scott Corp., New York City, Contrs. 2,750,000

Ga., Savannah—War Department
Dredging, Savannah Harbor; Arundel Corporation, Baltimore, Contrs. 426,000

Ky., Lexington—U. S. Housing Project
Superstructure of Blue Grass and Aspendale housing projects; Walter Butler Co., St. Paul, Minn., (low bidder) 1,412,000

Ky., Louisville—City
Buyer Headquarters building; Sullivan & Cozart, Contr. 152,000

Md., Baltimore—Continental Oil Co.
Alterations and additions to Fairfield plant 200,000

Md., Baltimore—City
Municipal Art Museum; North-Eastern Construction Co., Contr. 444,000

Md., Baltimore—Treasury Department
Alterations to Customs House; Carlstrand Engineering Co., Contr. 102,000

Md.-Delaware—War Department U. S. Engineers
Dredging on Chesapeake & Delaware Canal
Section I—Standard Dredging Co.; Section 2—Arundel Corp., Baltimore; Section 3—Atlantic Gulf & Pacific Co., New York City, Contrs. 2,100,000

Mo., Fulton—State Building Commission
Psychiatric clinic building and hospital; Simon Construction Co., Columbia, Mo., Gen. Contr. 435,000

Mo., Jefferson City—State Building Commission
Hospital building and dormitory; E. C. Childers Construction Co., Kansas City, Mo., Gen. Contrs. 360,000

Mo., Kansas City—School District of Kansas City
Southeast high school; Kaiser-Ducett Co., Chicago, Ill., Gen. Contr. 800,000

Mo., St. Louis—Board of Education
Garfield grade school; John Hill Construction Co., Gen. Contr. 220,000

N. C., Charlotte—Piedmont & Northern Railway Co.
Modernizing sub-station equipment 150,000

Okla., Oklahoma City—Board of Education
Northeast high school; Tankersley Construction Co., Gen. Contr. 235,000

Okla., Oklahoma City—U. S. Housing Administration
Superstructure of Rotary Park housing project; Leo Sanders, Gen. Contr. 1,500,000

S. C., Charleston—U. S. Housing Administration
Superstructure Meeting Street Manor and Cooper River housing project; J. A. Jones Construction Co., Charlotte, N. C. (low bidder) 980,000

Tenn., Nashville—City
Market house; Foster & Creighton Co., Contrs. 238,000

Tenn., Nashville—U. S. Department of Interior Housing Administration
Andrew Jackson Court housing project; J. Slotnik Co., Boston, Mass. (low bidder) 1,479,000

Tex., Eagle Pass—Maverick County Water Control and Improvement District No. 1
Construction canals and rehabilitation of water and flood control system; W. E. Callahan Construction Co., Dallas, Contrs. 1,475,000

Tex., Houston—Rheems Manufacturing Co. of California
Drum plant; W. A. Brunet, Contr. 100,000

Tex., Houston—City
Exposition and convention hall, Knutson Construction Co., Gen. Contr. 1,100,000

Tex., San Antonio—City
Southwest junior high school; E. W. Oeffinger, Gen. Contr. 200,000

W. Va., Huntington—Johnson Memorial Methodist Church
New building; H. G. Whittenberg, Louisville, Ky., Gen. Contr. 120,000

—Photographed July 20, 1936

Modern dual boulevard under way through high grade

INDUSTRIAL-RESIDENTIAL DEVELOPMENT

on unparalleled location--10 miles from Baltimore where many nationally and internationally known plants are located.

Running clear through the center of this 340 acres of picturesque property, isolated for years as a State rifle reservation, is this direct highway from Baltimore to Annapolis, within easy reach of the nation's second eastern seaport of Baltimore and the City of Washington, the nation's capital.

•

MANUFACTURING PLANTS now in congested centers will find unusual advantages here for new or branch plants, residential community; schools, churches, cultural and educational facilities for both employees' and officials' families.

•

For a limited time we will donate a few suitable tracts for appropriate high grade enterprises. Make application with full details including approximate number of employees and families requiring homes.

We have an interesting story of unusual merit to tell and will send photographs, maps, plats and other information.

CORRESPONDENCE INVITED

THE GLENBURNIE DEVELOPMENT COMPANY

George B. Furman
President

1409 L Street, N. W.
Washington, D. C.

IRON, STEEL AND METAL MARKET

THE steel industry has been experiencing the best mid-summer business in several years. With mills operating at 70 per cent of capacity during July, as compared with 44 per cent a year ago and under 30 per cent two years ago, a fair index is furnished of the extent of the increased activity in general business. Few predicted that the industry would reach such an encouraging rate of operation during the summer months. Expectations are that demand will continue good and that August activity will not fall much below July operations, and the outlook for the ensuing months is promising.

Steel making in the South at the end of July increased to 58 per cent of capacity with active demand of mills, fabricating shops and other steel consumers in prospect. Improvement is expected to be maintained because of increasing orders and requests from buyers for speedier deliveries.

Steel Price Trend Up

After advances made for the third quarter the steel-price structure remains firm. Consumers looking for lower prices have been unable to get concessions and a certain amount of structural steel was specified in order to get under the deadline of July 31, to which second quarter prices were extended in some cases. Indications are that sustained operations in manufacturing steel will be maintained for a reasonable period because of the upward trend in scrap prices. Advances of 50 cents a ton during the latter part of July were made by dealers in the Pittsburgh District, bringing the price to $14.75 and $15.25 per ton. The scrap markets in other sections of the country are reported strong. About 60 per cent of new steel is made from scrap. Rail prices have advanced to within striking distance of those prevailing in 1929. Standard steel rails were priced at approximately $43 a ton in July, 1929. The present price is about $36.37. Relay rails, 60 to 90 pounds, at Pittsburgh in 1929 were bringing from $24 to $29.60; while at present the price for these at Pittsburgh is $25.50 to $28. Light rails, 24 to 45 pounds, at the mill in 1929 cost $36 and for these, the Pittsburgh and Chicago price is $35.

Buying More Structural Steel

Definite contracts for plates, bars, shapes and sheets for use in building projects brought structural steel orders to a high point in July. Pittsburgh mills have been booked heavily with plate and shape orders. One of the larger orders was for 6,000 tons of steel piling to the Jones & Laughlin Steel Corporation.

Although June bookings were not so large as those of February or May, the shipments of fabricated structural steel during June were the largest for any month since August, 1931, according to the final reports issued by the American Institute of Steel Construction. The June bookings amounted to 54.9 per cent of normal (the annual average for 1928-31 inclusive). The bookings for the six months of the current year were better than the tonnage booked in any same six-months since 1931.

The shipments of fabricated structural steel during June amounted to 64.4 per cent of normal, but were the highest for any month this year. The total shipments for the six months period ending with June averaged 48.2 per cent of normal.

FABRICATED STRUCTURAL STEEL

	Bookings, tons		Shipments, tons	
	1936	1935	1936	1935
January	120,102	64,306	78,633	89,627
February	140,411	75,841	75,922	68,527
March	106,717	102,325	104,861	85,132
April	109,019	95,380	131,269	85,629
May	145,902	69,448	135,939	84,115
June	128,520	120,690	150,790	91,608

Steel Ingot Production Highest in Six Years

The first half-year's figures show an increase of about 33 per cent in steel ingot production although the June output was slightly under May. Since the output recently reached a new peak of 74 per cent of capacity, it was expected that production would be larger but the July operations were about the same as for June when 3,984,845 tons were made, the highest in six years with the exception of May.

MONTHLY INGOT OUTPUT

January	3,049,439	2,871,531
February	2,967,803	2,777,765
March	3,346,489	2,858,141
April	3,942,254	2,640,504
May	4,046,253	2,635,857
June	3,984,845	2,230,893

Pig Iron Production Up 37 Per Cent Over 1934

Final production figures issued by the Bureau of Mines for pig iron in 1935, exclusive of ferro-alloys, show 20,827,196 gross tons compared with 15,686,442 tons in 1934. The production of pig iron in 1935 required 34,127,246 tons of domestic iron ore and manganiferous iron ore; 1,370,708 tons of foreign iron ore and manganiferous iron ore; 2,637,464 tons of cinder and scale, and 666,220 tons of purchased scrap—a total of 38,801,638 tons. In addition, 883,500 tons of home scrap and 1,147,000 tons of flue dust were consumed in 1935.

The shipments of pig iron from blast furnaces in 1935, amounting to 21,178,353 tons valued at $358,145,499, showed an increase of 36 per cent in quantity and of 37 per cent in value over 1934. The general average value of pig iron of all grades at the furnaces in 1935 was $16.91 a ton compared with $16.73 in 1934.

Pig iron shipments from Southern furnaces in 1935 amounted to about 3,090,000 tons which was an increase of 25 per cent in output over 1934. Principal shipping states were: Alabama 1,324,942 tons; Kentucky 213,837 tons; Maryland 863,861 tons, and West Virginia 672,104 tons.

Activity in South

Continued activity at 58 per cent of capacity in steel making in the Birmingham district is expected. Substantial orders have been received and little seasonal recession has been felt. New business is holding the backlog at a fairly good level and prospects are good for several weeks with 13 open hearth furnaces in operation at Fairfield, Ensley and Gadsden.

Cast iron pressure pipe manufacturers are operating steadily.

Steel making in the Southern territory, therefore, is holding up better this summer than for several years.

Among recent orders have been 11,000 tons of 60 inch steel pipe to be used on the Birmingham Industrial water project; 700 steel hopper and steel sheathed cars to be built by the Pullman Car & Standard Manufacturing Co.; 4,000 tons of steel to be fabricated by the Virginia Bridge Company at its Roanoke and Birmingham shops for the new paper mill at Charleston, S. C., being erected for the West Virginia Pulp and Paper Company; 700 tons of structural steel for the Tubize-Chatillon Corporation's rayon mill addition at Rome, Ga., to be supplied by the Virginia Bridge Company. Added facilities for the manufacture of larger diameter pipe have been made by the Ingalls Iron Works Co., at its North Birmingham plant and by the Chicago Bridge & Iron Co., at its East Birmingham plant.

Wages and Employment

Weekly wages actually received in the pay envelopes of the nearly 446,000 wage-earning employees in the steel industry average more than 18 per cent higher than the average wages of employees for all manufacturing industries, reports the American Iron and Steel Institute based on payroll figures compiled by the United States Department of Labor.

The latest government records show steel employees earning an average of $26.38 in March, which compared with average weekly earnings of $22.25 for employees in all manufacturing industries.

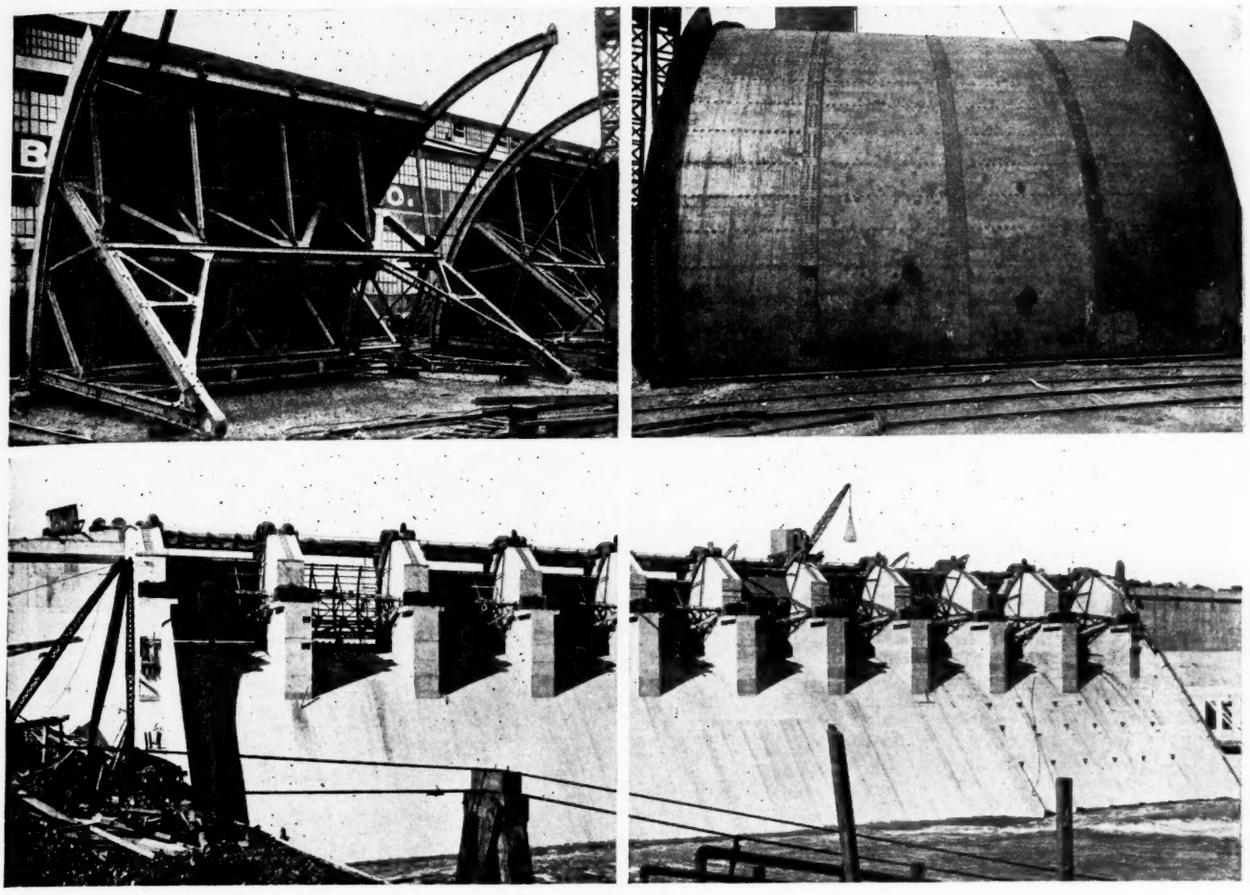
The prevailing level of wage rates in the steel industry permits steel employees to earn an average of $4.13 more per week than other manufacturing workers while on comparable working schedule.

Records of the Department of Labor and the League of Nations show that the American steel worker receives on an average more than twice as much as the steel worker in any other country, six times as much as the Japanese steel worker, and more than three times as much as the average employee in Belgian steel mills.

Between 1929 and 1933 dividends to steel stockholders were reduced more than 94 per cent—from $189,000,000 to $11,000,000. In 1935, when total iron and steel payrolls exceeded $550,000,000, stockholders received less than $39,000,000, equivalent to only 7 cents for each dollar in payrolls. Out of every dollar received from the sale of steel products, 41 cents goes into payrolls, while dividends account for only 1½ cents. The remainder goes for raw materials and other expenses.

In the light of these figures and the announced raise in wage rates by the United States Steel Corporation, the threatened drive to unionize the steel industry is up against facts that are incontrovertible.

Care in the Shop Avoids Trouble on the Job



FITTED FOR THE JOB

Upper pictures show Taintor Gates being assembled and fitted together in our Memphis Plant. We manufactured 10 of these for the Carpenter Dam on Ouachita River, Hot Springs, Ark. Lower picture shows Carpenter Dam with gates in place.

Taintor Gates, as they are called, control the water elevation in dams. They must fit true and close for water-tightness and ease of operation. And then they have to stand considerable pressure. All of which calls for an exact job of manufacture.

We have built many taintor gates, sluice gates, intake gates, in fact all kinds of steelwork for dams and power projects. Which we mention here as evidence of our widely varied experience and ability.

VIRGINIA BRIDGE

Steel Structures

VIRGINIA BRIDGE COMPANY

Roanoke, Birmingham, Memphis, Atlanta, New York, Charlotte, Austin, El Paso

Plants at Roanoke—Birmingham—Memphis

LUMBER NEWS OF THE MONTH

Southern Pine Activity Highest Since 1930

Gain in Production, Shipments and Orders

PRODUCTION, shipments and orders for Southern pine lumber for the six months ended June 30, have been the highest for any similar period since 1930, based on a survey by the Southern Pine Association. Employment and total wages in the industry at the end of April were likewise the highest in several years. July activity has maintained the improvement rate and is substantially above July, 1935.

Production Average Up 18 Per Cent

In the first six months of this year, production of Southern pine averaged 514,000,000 feet per month, an increase of 18 per cent over the average monthly output for 1935, and an increase of 101 per cent over the average monthly production of the depression low year 1932. Production for the first six months of this year has been the highest since 1930, being 17 per cent below the average that year and 47 per cent below the average for 1929.

Shipments Up 13 Per Cent

Shipments during the first half of 1936 averaged 528,000,000 feet per month, or 103 per cent of the production in this period. Shipments are up 13 per cent for the monthly average of 1935 and are 71 per cent higher than the average for 1932, being the best since 1930 which showed 10 per cent more than in 1936 and in 1929 44 per cent.

Orders Gain 10 Per Cent

Southern pine orders in the six months ended June 30, have averaged 521,000,000 feet per month, or 101 per cent of total production. Orders are up 10 per cent over the average for 1935 and are 69 per cent higher than the average for 1932. Orders are the best since 1930, being about 10 per cent below that year's average and 45 per cent below the average for 1929.

Stocks 55 Per Cent Under Peak

As of July 1, 1936, stocks held by the industry are estimated at 1,550,000,000 feet, representing a decrease of about 5 per cent from both January 1, 1936, and July 1, 1935. Compared to the depression peak on January 31, 1931, when stocks held by the industry totaled 3,458,000,000 feet, current holdings show a decline of 55 per cent. Current stocks are equal to about three months of current demand.

Price Advance to 1930 Level

Mills reporting to the Southern Pine Lumber Exchange, realized an average f.o.b. mill sales return in June of $25.88, the best price for any month since June, 1934, when the average return was $27.47. As compared with January, 1936, price, the June figure is up 12 per cent, and is nearly 12 per cent higher than in June, 1935. The June return is slightly below that for 1934, and with this exception is higher than for any full year back to 1930.

Exports Gain 14 Per Cent

Southern pine exports through Gulf ports in the five months ended May 1936 totaled 88,308,000 feet, against 77,328,000 feet in the like period of 1935, an increase of 14 per cent. Of the six continental areas listed, Europe, South America and the West Indies show increases over a year ago, of 34 per cent, 3 per cent and 17 per cent respectively; while Africa, Central America and North America (Canada and Mexico) show decreases of 65 per cent, 35 per cent and 39 per cent respectively.

Nation's Lumber Production Double Depression Low

AFTER reaching 10,151,000,000 feet in the depression low of 1932, it is estimated that the lumber production of the country will be in the neighborhood of 22,774,000,000 feet for 1936. The output last year was 17,778,000,000 feet, with about 43 per cent being produced in the Southern states. In the pre-depression year 1929, production for the country was 36,886,000,000 feet.

Lumber production was steadily declining throughout the country and even during the boom years was nothing like the volume reached in the decade of 1910 when more than 40,000,000,000 feet of lumber were cut yearly.

Further recovery in the lumber industry, of course, will depend upon the general advance in the construction field. In 1935, nearly 58 per cent of all lumber consumed was used in building. Continued expansion in building activity will be influenced by construction costs which have been increasing. A revival of residential building is in sight. The rise in volume of new residential construction is indicated by building permits recorded in the principal cities of the United States.

With a monthly average index of 100 for 1933, the index for June, 1934, was 82.3 increasing to 248.6 in June, 1935 and to 742.9 in June, 1936. This last figure is higher than for any month since April, 1931 and represents one of the most noteworthy gains in any industry since the low point of 1933.

The volume of alterations and repairs has not varied as greatly as that for new construction.

Based on a study by the Alexander Hamilton Institute, it is believed that a reduction in the price of lumber would have little effect in stimulating building without a reduction in other construction costs. This would necessitate also a reduction in freight rates. Other costs in a number of instances are relatively higher than lumber. Labor rates have increased not only in the construction field but in the fabrication of materials entering into the building trades.

With 1926 having an index of 100, the wage rate during May, 1936, for skilled building workers was 89.1 and common labor 101.8; rent was 76.1; the lumber price index was 83; cement 95.5; structural steel 92, and brick and tile 88.8.

Help Timber Growth

DEVELOPMENT of a method for procuring increased germination of black locust seed, improved methods in artificial reforestation, as well as facts in regard to influence of severe fires on pine sapling stands and results of truck logging in second-growth shortleaf and loblolly pine, were among the accomplishments of the Forest Service during the past year.

Field work of a southern forest inventory was completed on 107,000,000 acres by a line-plot survey, bringing the total in the forest survey for the South to 186,000,000 acres.

Experiments were carried out by the Southern Forest Experiment Station at New Orleans. The station has published a number of bulletins on these subjects.

Producing More Kraft Paper

10 Per Cent Gain in Output This Year—Kraft Paper and Board Production Southern Mills $50,000,000 in 1935

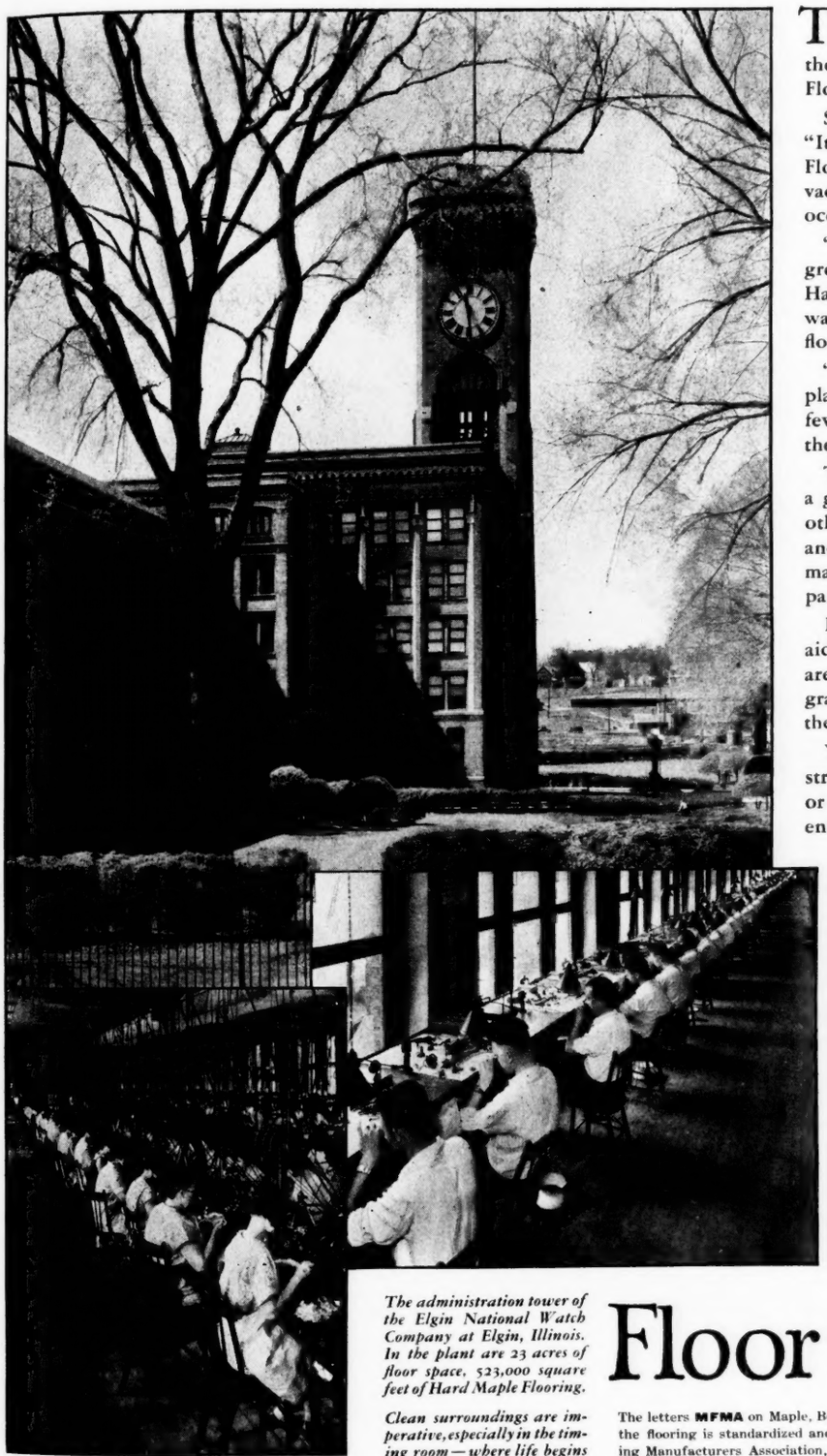
IN making greater use of Southern forest resources, there is opening up for farm woodland and timber owners additional outlets for their vast supplies of raw materials for the paper and kraftboard industry. Opportunities for establishing additional pulp and paper mills, by-product and allied manufacturing plants in the South were never better.

With kraft paper and board production now about 10 per cent ahead of last year's output, domestic production is expected to set a new high record in 1936. Last year in the Southern states, where the industry is now centering, more than $50,000,000 of kraft paper and board were manufactured.

Demand for kraft paper in shipping containers, corrugated material, insulation, panel board for automobiles and cartons is growing. Such material is being used in ever increasing quantities for shipping commodities including such a varied line as pins, refrigerators, cigarettes, electric light bulbs, canned goods, cereals, sugar, soap, shoes, etc. Development of the use of kraft paper in heavy-duty and multiwall sacks and bags has also added to the consumptive requirements for the output of Southern kraft paper mills.

THE WORLD'S LARGEST MAKER OF FINE TIMEPIECES

RELATES ITS EXPERIENCE WITH 523,000 SQ. FT. OF FLOORING



The administration tower of the Elgin National Watch Company at Elgin, Illinois. In the plant are 23 acres of floor space, 523,000 square feet of Hard Maple Flooring.

Clean surroundings are imperative, especially in the timing room — where life begins in a watch. Northern Hard Maple, easily cleaned and creating no dust of its own, gives exceptional service.

Long lines of machines such as these create heavy oil deposits in the plant. But Elgin says the oil has no ill effect on Hard Maple Flooring.

THE manufacturing of fine timepieces requires a clean, dust-free plant. Under these exacting conditions, Hard Maple Flooring again proves its many advantages.

Says the Elgin National Watch Company: "It has been our experience that Hard Maple Flooring is easily cleaned, broomed and vacuumed and keeps its fine appearance with occasional washings.

"Some of our flooring is exposed to a great deal of oil. But we have found that Hard Maple absorbs oil very slowly, so that washing at regular intervals preserves our floors in spite of the oil.

"A great deal of the Maple Flooring in our plant is over 35 years old and has had very few repairs, which were easy to make with the same material."

Thus at Elgin, Hard Maple's cleanliness is a great help to precision manufacture. In other plants, requiring heavy equipment and heavy rolling trucks, Hard Maple's remarkable resistance to abrasion proves particularly advantageous.

But everywhere, its warm, dry resilience aids workers' efficiency — plant alterations are simplified — and tough-fibred, tight-grained Hard Maple remains smooth through the years—as proved in countless plants.

You can floor with Maple in blocks or strips, with or without pattern, over wood or concrete sub-floors, or over your present floor. Before modernizing or building anew, be sure to investigate its many advantages, its unequalled economy over a period of years.

Our "Grading Rules" book describes the various grades and gives standard specifications for laying and finishing. Write for free copy.

MAPLE FLOORING MANUFACTURERS ASSOCIATION

1797 McCormick Building, Chicago, Ill.

See our catalog data in Sweet's, Sec. 15/53. Let our service and research department assist you with your flooring problems. Write us.

Floor *with* Maple

The letters **MFMA** on Maple, Beech or Birch Flooring signify that the flooring is standardized and guaranteed by the Maple Flooring Manufacturers Association, whose members must attain and maintain the highest standards of manufacture and adhere to manufacturing and grading rules which economically conserve these remarkable woods. This trade-mark is for your protection. Look for it on the flooring you use. **MFMA**

GOOD ROADS AND MOTOR TRANSPORT

Low Cost Road Construction and Maintenance

Calcium Chloride as Bond Medium

REGARDING the use of calcium chloride in road construction and maintenance, Ray A. Giddings, secretary of the Calcium Chloride Association, Detroit, Mich., which carries on a research and distribution service for disseminating information relative to the uses of calcium chloride, states that it is particularly difficult for the Association to differentiate in the result of its efforts in the territory from Maryland to Texas, as distinguished from other sections, but that there has been a "phenominal development and general interest in soil aggregate stabilization for low cost road surfacing and as base course for higher type surfacing."

This work, commonly involving the integral use of calcium chloride as a bond medium, has become an important part of the road construction programs of Minnesota, Illinois, Indiana, Michigan, and Ohio, with every prospect that Iowa and Pennsylvania will have considerable of such mileage in their early construction programs. Mr. Giddings points out that there has been much scattered interest, much of it in the Southern states where low cost roads are most needed, and particularly in the PWA farm-to-market road program, as well as in progressive county road construction programs.

In a report on the "Effect of Calcium Chloride on Portland Cements and Concretes" by Paul Rapp, research associate at the National Bureau of Standards for the Calcium Chloride Association, reprinted from the proceedings of the Fourteenth annual meeting of the Highway Research Board, and approved for publication by the Director of the National Bureau of Standards, the value of calcium chloride in concrete is definitely confirmed. Facts developed by the study are being forwarded to county engineers and contractors all over the country by the Calcium Chloride Association and it is declared that marked interest is being noted. The use of calcium chloride in concrete projects has so many advantages as regards strength, workability, control of volume changes, cold weather protection, etc., says Mr. Giddings, that it is expected that with these facts so definitely established there is sure to be a notable increase in the use of the product.

Another national development to which Mr. Giddings refers is the rapidly spreading practice and demand for winter ice control measures on pavements, the importance of sustaining winter traffic having led to almost universal adoption of maintenance programs adequate to cope with the situation. With this, he says, it is rapidly becoming a routine patrol service for highway equipment to spread sand or other gritty material treated with calcium chloride on icy surfaces. The effectiveness of the treated grits so greatly exceeds that of untreated material that it is declared not only more economical but much longer effective, since the chemical permits the grits to bite into the ice and provide a skid-proof surface.

H. F. Clemmer, Engineer of Materials, District of Columbia, in a paper presented before the Texas Highway Short-Course on "Stabilized Soil Roads", makes the observation that the marked effect of calcium chloride on the density of soil specimens has been shown by tests made at George Washington University under the direction of Professor F. A. Hitchcock which did not involve the use of compacting equipment. Drying tests were made on a number of soils with an admixture of different percentages of calcium chloride, and on analyzing the results, it was shown that those specimens containing the calcium chloride dried to a greater density than the untreated specimens, the specimens containing 2 per cent of calcium chloride having a final density of 114.3 pounds per cubic foot, while the same soil containing no admixture had a density of but 104 pounds. "This increased density," says Mr. Clemmer, "makes the road surface more impervious to moisture and more capable of satisfactorily carrying traffic loads. To construct and maintain such a road surface, it is necessary that proper cohesion of the soil particles be developed and that frictional resistance be obtained."

Testing Cotton Roads in Many States

COTTON fabrics designed by workers of the Bureau of Agricultural Economics and North Carolina State College are being used in road-building experiments in 24 states under Federal-State projects to develop new and extended uses for cotton.

The cotton fabrics, distributed by the Agricultural Adjustment Administration in its program to encourage new uses of cotton, will be used to re-enforce nearly 600 miles of bituminous-surfaced roads in the various States.

The fabric of open-mesh construction is ordinarily laid over a bituminous priming coat on top of the graded and surfaced road bed. This permits the bituminous material to penetrate and cover the individual yarns. It is covered with a second bituminous coating and crushed mineral aggregate. The road is rolled, and another bituminous coating applied. Into this, a layer of "chips" is rolled.

A pamphlet "Cotton Fabrics for Bituminous-Surfaced Roads" giving the history and present status of experiments has been prepared for free distribution by the Bureau of Agricultural Economics, Washington, D. C.

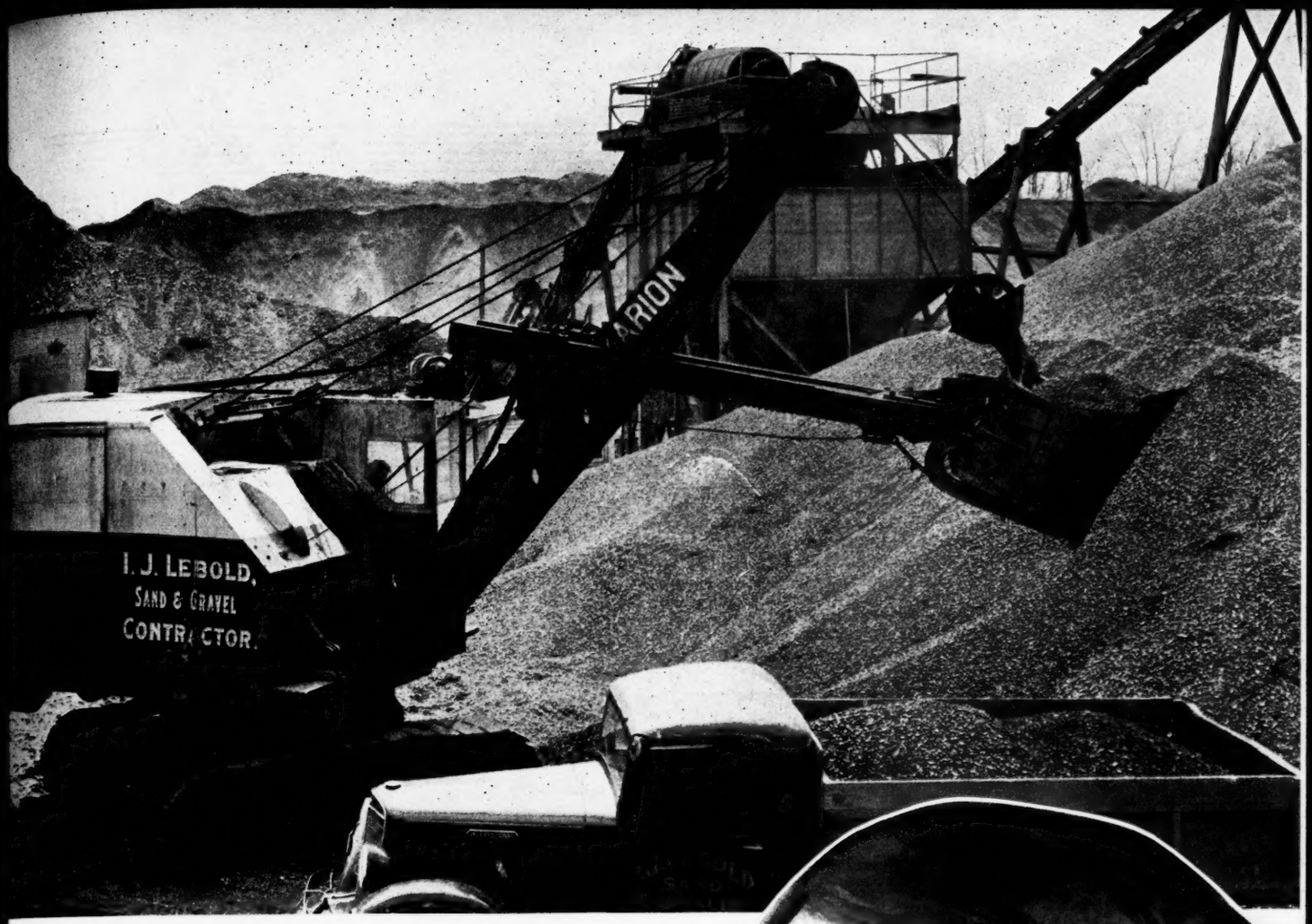
Travels on Road or Rail

Developed after more than two years' research by the Evans Products Company of Detroit, Mich., a combination rail-highway vehicle, which adapts the flexibility and economy of automotive principles to rail use, is now in production. This new method of transportation has been introduced in the South as well as in other sections of the country.

The new unit, designed to travel with ease on rails and on highways, is equipped with the Reo Gold-Crown engine, made by the Reo Motor Car Company, of Lansing, Mich. Supplied with retractable pilot axles, front and rear, the Auto-Railer, as the vehicle is called, travels on the rails on its pneumatic tires, and is held in place by flanged wheels on the pilot axles. Exceptional tractability and ease of riding, it is declared, result from the operation of this principle. The vehicle mounts and leaves the rails at any grade crossing.

The Arlington-Fairfax Railway Co., Rosslyn, Va., recently ordered 9 auto-railers and has applied to the Interstate Commerce Commission for authorization to operate the equipment from its Rosslyn terminal into Washington, D. C.

Evans Auto-Railer



"I DID NOT HAVE TO LOOK TWICE TO KNOW A MARION WAS THE SHOVEL FOR ME"

SAYS *I. J. Lebold* OF MINERAL CITY, OHIO

"Naturally I was critical in selecting my first power shovel. I wanted speed, dependable performance, simple operation and chief of all—low maintenance. I am pleased to say I have found everything I wanted in my Marion Type 331-3/4 cu. yd. Clutch Type shovel. Right now it is dividing its time between my stone quarry and in digging clay for tile."

MARION

CLUTCH TYPE EXCAVATORS

A MACHINE FOR EVERY MATERIAL HANDLING JOB

WRITE FOR BULLETIN DESCRIBING MARION FEATURES

THE MARION STEAM SHOVEL COMPANY
MARION, OHIO, U. S. A.

EQUIPMENT NEW AND IMPROVED

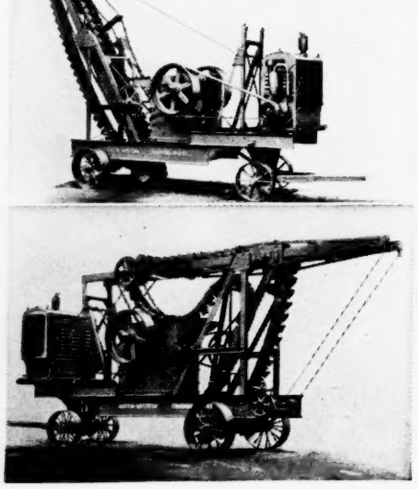
Link-Belt Sand Separating Unit

Link-Belt Company, Philadelphia and Chicago, announces a new foundry sand preparation unit, of high capacity, to supplement the Link-Belt line of sand revivifiers. To be known as the Link-Belt "Sep-Aerator," because it performs automatically the two-fold function of properly aerating and mixing the sand before delivery to molder's hoppers, and of separating from the sand such shot metal, pebbles and small refuse as may not have been caught by screen or magnetic pulley. The new unit is said to be particularly suited for continuous mechanical handling systems. It has few parts, all enclosed within steel housing, fitted with an air release pipe and other means for preventing blasts of air along the belt conveyor which receives and carries the aerated sand from the machine to the respective molder's storage hoppers. The position of the beater shaft may be adjusted horizontally as required to give proper control of direction of the sand stream.

Small Portable Crushing Plants

The Austin-Western Road Machinery Company, of Aurora, Ill., announces a new line of small portable crushing plants for contractors and public officials, powered by Waukesha motors with power take-off by a V-belt drive. Each unit of the line consists of a crusher, folding elevator, and a motor, all mounted on a steel tired truck for easy transportation. Known as the C. E. P., the line embraces eight sizes with jaw openings of 9 by 16, 9 by 20, 12 by 20, 15 by 20, 4 by 40, 9 by 40, 18 by 38, and a roll crusher with 30-inch rolls having a diameter of 18 inches for crushing accurately sized stone.

A Small Austin-Western Crushing Plant



Hand-Chain Hoists With Precision Bearings

Placing particular emphasis on the importance of precision-ground bearings to minimize friction, the Conco Engineering Works, Mendota, Ill., has introduced an improved spur-geared hand-chain hoist in which precision ball bearings, accurate machining of parts and other features combine to lessen the energy required to move a given load in a given time. This type of hoist, used for handling material, is made in capacities from ¼ ton to 6 tons, although other Conco Spur-Geared Hand-Chain Hoists of similar design are available in capacities up to 20 tons. Hoists of 3 tons capacity and up are of the double-line type with precision ball bearings on the idle sheave axles. A safety load-chain guide is provided as "jam insurance" to keep the chain from riding out of the pocket or fouling, or leaving the wheel, no matter from what angle the hand-chain is pulled. The chain is electrically welded with high tensile-strength, elastic-limit and elongation, while the hooks are of the "safety" type dropforged, heat-treated and tested.

Conco Spur-Geared Hand-Chain Hoist

Largest Continuous Electric Furnace

With an output of 7½ tons per hour, based on strip 56 inches wide, a new controlled atmosphere continuous roller hearth furnace, 325 feet long, has been purchased by The Ford Motor Company from Westinghouse Electric and Manufacturing Company, East Pittsburgh, Pa. This is declared to be the largest electric furnace in the world and will be used for bright normalizing automobile body stock in a continuous strand or in strip. The Ford company already has a 227-foot Westinghouse furnace of this type which has been in operation about a year.

High Vacuum Steam-Jet Ejectors

For producing vacuums from a few inches of mercury to within less than one millimeter of perfect vacuum, Worthington Pump and Machinery Corporation, of Harrison, N. J., is offering steam-jet ejectors in single or multiple units. The Worthington ejector, based on fundamental thermodynamic principles to produce the highest vacuum ever attained, it is declared, is the result of thousands of tests over a period of 18 years. Various types of the ejector are described and illustrated in Bulletin W-205-B2 which shows them in their application to many industries, such as chemical, petroleum, wood-treating and general processing, together with condensers for power generating stations.

Speed-O-Matic Control

Seeking to develop means of reducing all possible fatigue in methods of working, the Ling-Belt Company, Chicago, Ill., builders of power operated shovels, draglines and cranes, announces what it designates as a "revolutionary development" in the operation of such machines. It is a power control, with short, easy throw-levers, declared to eliminate operator fatigue, permit speedier operation, and make for greater output. To be known as the Speed-O-Matic Control, the new device is refered to as having literally no wearing parts between clutches or brakes and the conveniently arranged control stand behind which the operator is comfortably seated, at the front of the cab. This control is standard equipment on Ling-Belt shovel-dragline-crane models K-40, K-45, K-48 and K-480.

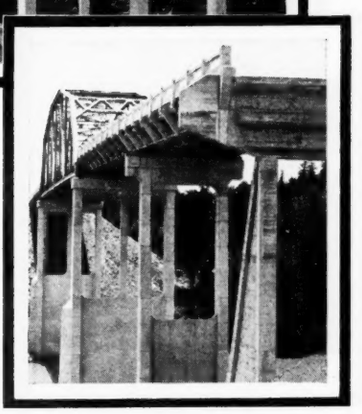
Largest Aluminum Structural Units

According to the Aluminum News-Letter, official publication of the Aluminum Company of America, Pittsburgh, Pa., honors for fabricating what are apparently the largest aluminum structural units ever built, go to the Nashville Bridge Company, Nashville, Tenn. These units will comprise the seven floodgate bulkheads for the navigation and flood control dam across the Ohio River at Gallipolis, Ohio, to be made of aluminum alloy plate and structural shapes. They will be 128 feet long, 13 feet, 10 inches deep front to back, and 4 feet, 4 inches high. Stacked one on another, they will form a cofferdam over 28 feet high, to be used for emergency repairs, painting and maintenance of the dam's giant roller gates. Aluminum was chosen for the bulkhead material because of its light weight, high strength and resistance to corrosion.

Austin-Western Elevating Grader

The Austin-Western Road Machinery Company, Aurora, Ill., road machinery manufacturers, is distributing a folder illustrating and outlining salient details of the company's 3-Wheel Elevating Grader of large capacity. The machine is powered by a six-cylinder heavy duty motor that develops 62 horsepower.

THEY SHALL PASS!
• • FOR MANY YEARS TO COME



This National highway bridge will never invoke the military slogan "They Shall Not Pass." Traffic will flow freely over this bridge for many years to come, for it is built to stay put through heavy duty and heavy weather.

This sturdy bridge has a foundation and roadbed reinforced with GULFSTEEL deformed bars, with super-structure of GULFSTEEL plates, angles, channels and bars . . . Fabricators and contractors select GULFSTEEL products because of the high quality of the steel, correct chemical and physical characteristics, accuracy of gauge and dimensions, smooth surface and edges, and other features that eliminate costly delays.

Prove GULFSTEEL products yourself — *specify them on your next job* . . . GULF STATES STEEL COMPANY
Birmingham, Alabama

Bridge near Birmingham, Alabama, fabricated of GULFSTEEL plates, angles, channels and bars. GULFSTEEL deformed bars used in concrete foundations and roadbed.

GULFSTEEL
The Steel with PERSONALITY

FINANCIAL NEWS

Loss of Taxable Wealth

Private investments in light and power properties in the territory in which the TVA operates amount to 900 million dollars, as pointed out in the Brief for the utilities in a suit started to test the validity of the TVA before the Federal Court in Birmingham.

The utilities hold that if the TVA is finally held constitutional and the project is developed as now proposed, this vast investment of private funds will be destroyed.

Aside from the social injustice of a result of this kind, the communities involved in the TVA area find that considerable part of their taxable wealth is in serious jeopardy. The TVA has high-handedly declared itself independent of any government jurisdiction outside of Washington; and while it did pay $20,000 in taxes as a patronizing gesture, private utilities pay more than 14 million dollars a year in taxes. The loss of this income from private firms would place many valley communities in a decidedly embarrassing position.

For example, in Campbell County, Tenn., the TVA has acquired real estate now exempt from taxes, resulting in a loss of revenue to the county government of approximately $22,000 a year.

The TVA now proposes the abandonment of a branch of the Southern Railway running from Vasper to LaFollette, which will further deplete county revenue by more than $1,000.

The loss of this taxable property to a county which already has a heavy bonded indebtedness is a serious matter and shows the difficulty of economic planning by an autocratic government bureau and its attendant destruction, or, at best, arbitrary distribution of wealth.

Rail Income Grows

Net railway income of 140 Class I railroads in the first half of 1936 increased to $238,243,934, which is equal to an annual rate of return of 2.22 per cent, compared with 1.81 per cent of a year ago, as reported by the Bureau of Railway Economics of the Association of American Railroads. In the Southern District, Class I railroads had a net operating income of $32,366,971 for the first six months of 1936, as compared with $24,425,031 in the same period of 1935. Gross operating revenues showed an increase of 12.9 per cent over the same period last year, while operating expenses increased 9.1 per cent.

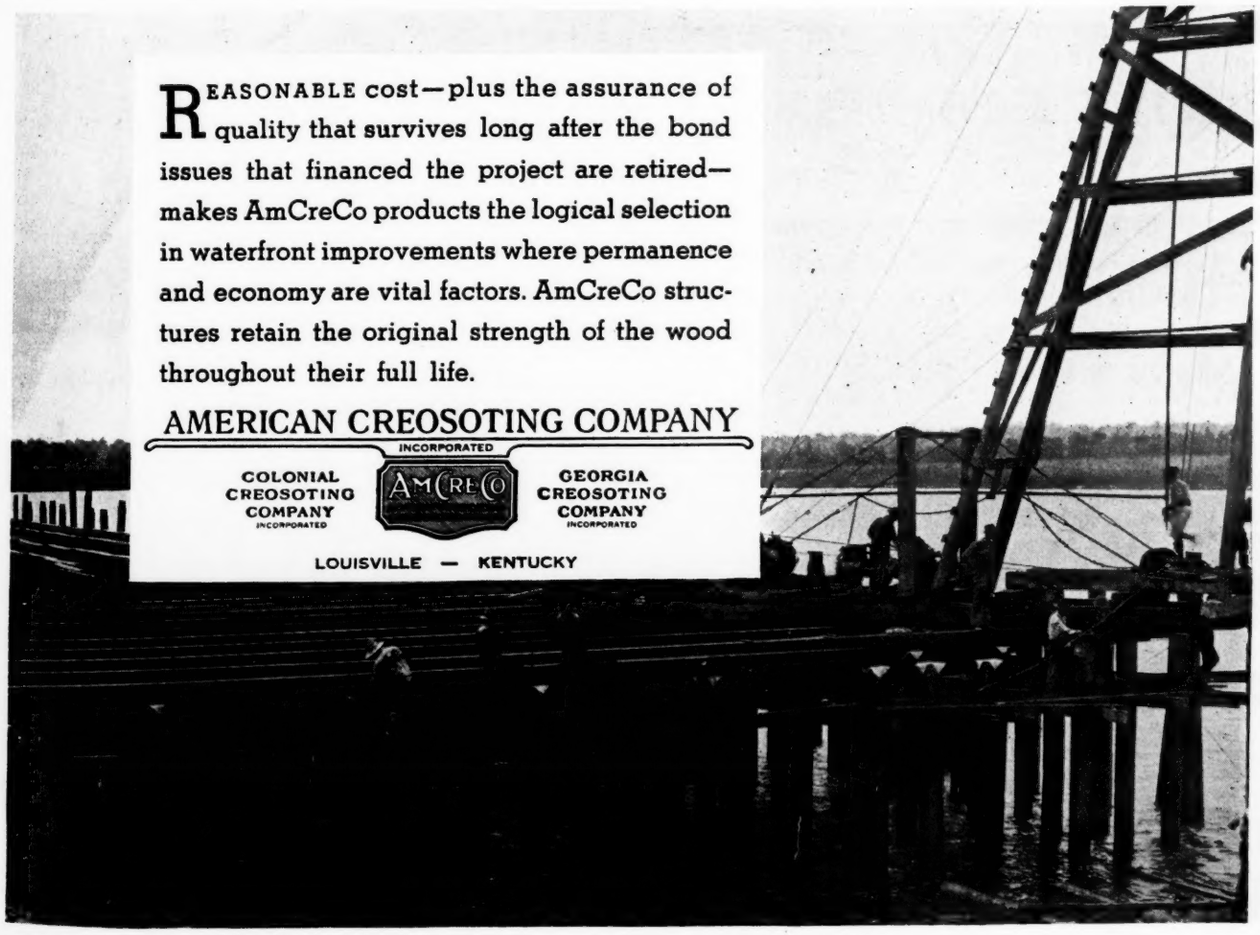
National Income Gains

National income increased to 53 billion dollars in 1935, according to an estimate by Secretary of Commerce Roper, in which he predicts that the figure will be increased to 58 billion in 1936. The low point of the depression was reached in 1932, when national income was 39½ billion. The increase of 13½ billion in national income compares with $14,300,000,000 net increase in the Federal debt. If our current recovery is solely attributable to the New Deal, as many of its advocates argue, the price of recovery appears rather high, for we are paying out more in increased Government expenditures than we are getting back in increased national income.

New Bond Issue

The Southern Kraft Corporation has offered a new bond issue of 14½ million dollars, bearing 4¼ per cent and due in 1946, through the First Boston Corporation, a subsidiary of the International Paper Company.

(*Continued on page* 54)



Financial News

(*Continued from page* 52)

Public Debt at 50 Billion Dollars

The subject of Government debt is becoming increasingly interesting—and is vitally important. The gross public debt of all governments in the United States as of February 29, 1936, is estimated at 50 billion dollars, representing an increase of about 50 per cent since 1929. These figures do not include contingent liabilities consisting of debt issues of three Federal corporations amounting to more than four billion dollars.

The Social Security Act will add another 47 billions to the Federal deficit; or, by any chance, is it the idea to use the funds collected under the Social Security Act to refund outstanding Federal obligations?

U. S. Steel

Semi-annual statements of the United States Steel Corporation show a gross profit from operations for the first six months of this year of $46,891,000, or an increase of $20,345,000 over the first half of 1935. After deducting charges against depreciation and obsolescence, the net profit for the first six months of this year was $19,897,000, as compared with $3,800,000 in the same period of 1935. The payroll increased by $30,686,000. Average hour earnings for all employees remained unchanged at 73 cents, while the number of employees was larger by 7.7 per cent.

Reserve Requirements Raised

The Federal Reserve Board acted last month to raise the reserve requirements of member banks in an effort to forestall any unsound, sudden expansion of credit. Surplus reserves will be reduced by about one and a half billion dollars; or to put it differently, the credit base will be reduced from approximately three and one-half billion to around two billion, which is sufficient to permit the expansion of deposits by an additional 20 billion dollars.

Georgia Tobacco

The tobacco crop in Georgia escaped drought damage and is expected to be even greater than the 1935 record high of 70,759,124 pounds. The markets open August 4 with a $15,000,000 crop in prospect. Last year's average price throughout the state was 18.91 cents a pound.

Banks and Social Security

It is probable that an amendment to the Social Security Act will be submitted to the next session of Congress to include national banks under the provision of the present law; but it is more probable still that the entire Act will be drastically revised, if not repealed altogether, as its many objectionable features are being more generally recognized. It has already been pointed out in government circles that a reserve fund under the Act of 47 billion dollars would defeat the purpose of the Law as far as employment security is concerned and that the chances of employment in private industry are reduced proportionately as the fund increases.

Farm Mortgages

Total farm mortgage loans recorded throughout the United States during the year ended May 31, 1936, amounted to 900 million dollars as compared with $1,440,000,000 during the previous one year period, the Farm Credit Administration in Washington has announced.

INDUSTRIAL NEWS

Engineers to Meet During Power Show

To permit its members to take part in the Twelfth National Exposition of Power and Mechanical Engineering, opening November 30, Grand Central Palace, the American Society of Mechanical Engineers will hold its usual annual meeting in New York during Exposition week. Also, the American Society of Refrigerating Engineers will hold its meeting in New York at the same time. The coming National Exposition of Power and Mechanical Engineering will be the twelfth under the management of the International Exposition Company, New York, and Charles F. Roth is again personally in charge.

Diesel Tractors in Movie Role

In Warner Brothers latest motion picture release, "Earthworm Tractors," Joe E. Brown, comedian, is teamed with Diesel-type tractors. During the filming the Caterpillar Tractor Company plant at Peoria, Ill., was taken over by Warner Brothers cameramen.

Gar Wood Appoints Nine Distributors

The following new distributors have been appointed by Gar Wood Industries, Inc., of Detroit, Mich., according to W. H. Hammond, sales manager of the hoist and body division: A. Fassnacht & Sons, Chattanooga, Tenn.; Baker Equipment Engineering Company, Charlotte, N. C.; Lone Star Equipment Company, El Paso, Tex.; Mississippi Truck Equipment Company, Inc., Jackson, Miss.; C. W. Rathbun Company, Oklahoma City, Okla.; Shaw Sales Company, Billings, Mont.; Allison Steel Manufacturing Company, Phoenix, Arizona; Felt Auto Parts Company, Salt Lake City, Utah; Union Iron Works, Spokane, Wash. The hoist and body division of Gar Wood Industries, Inc., manufactures hydraulic hoists and steel dump bodies to fit all types of truck chassis.

Westinghouse Air Brake Promotions

Charles A. Rowan, for the past four years president of Westinghouse Air Brake Company Pittsburgh, Pa., and vice chairman of the board of directors of the Union Switch and Signal Company, has been elected chairman of both companies, succeeding A. L. Humphrey who becomes Executive Committee Chairman. Succeeding Mr. Rowan, George A. Blackmore who has served as vice president and general manager of Westinghouse Air Brake Company, has been elected to the presidency.

American Hoist and Derrick Representative

American Hoist and Derrick Company, St. Paul, Minn., has appointed J. L. Praytor, 4601 First Avenue, North, Birmingham, Ala., as district manager for Alabama, North Carolina, South Carolina, Georgia, Florida, Tennessee, Kentucky and Mississippi. Mr. Praytor was formerly connected with the company for a period of years and is familiar with the "American" line of products, including hoisting and excavating machinery—locomotive cranes, hoists and derricks, power shovels, etc.

Changes in Cement Companies

Blaine S. Smith has resigned as president of Pennsylvania-Dixie Cement Corporation, New York City, to assume the presidency of the Universal Atlas Cement Company, Chicago, Ill., September 1, according to William A. Irvin, president of the United States Steel Corporation, of which Universal Atlas is a subsidiary. Mr. Smith succeeds B. F. Affleck, who retires as president of Universal Atlas, effective September 1. Joining the Universal Atlas Cement Company in 1908, Mr. Smith advanced through various positions and was elected vice president in 1926, resigning two years later to become president of Pennsylvania-Dixie Cement Corporation.

John A. Miller, formerly chairman of the board of Pennsylvania-Dixie, was elected president to succeed Mr. Smith, and Victor N. Roadstrum elected chairman of the board. George Kilian, acting secretary and treasurer, has been appointed assistant to the president. Walter S. Wing, general sales manager, and W. H. Klein, general operating manager, have been elected vice presidents and members of the board.

Koehring Announces New Distributors

New distributors for Koehring products have been appointed by Koehring Company, Milwaukee, Wis., manufacturers of shovels, cranes, draglines, Dumptors, pavers, mixers, mud-jacks, and trail-dumps, as follows: The Arizona Lumber Company, 9th and Jefferson Sts., Phoenix, Arizona, for Arizona territory; The Leland Equipment Company of Texas, 3915 Main Street, Dallas, Tex., for Dallas territory, and Roanoke Tractor & Equipment Company, 405 Center Avenue, N. W., Roanoke, Va., for Virginia territory. Mr. Burrows, formerly of Clark & Burrows, Dallas, will continue to serve his Dallas customers, and W. H. McIlhany, who is well known in Virginia, will serve as manager in charge of sales for the Roanoke Tractor & Equipment Company.

"Round-Trip Ticket For Pipe"

According to the repurchase plan of the Albert & Davidson Pipe Corp., Brooklyn, N. Y., the company first sells a customer high quality, hydrostatically tested new or renewed pipe, and then re-purchases unused pipe from the customer. Pipe re-purchased, according to the A & D plan, is thoroughly re-conditioned and made ready to go out "good as new" on another job.

Link-Belt Appointments

J. C. Bloomfield has joined the shovel, dragline, crane sales division of Link-Belt Company, Chicago, Ill., and will specialize on the application of Link-Belt machines to railroad service, according to announcement. Mr. Bloomfield has had wide experience in this field and is well known in railroad circles. L. P. Spillan, for many years a member of the department, has been appointed shovel and crane division sales manager in charge of sales to contractors, with supervision over all sales agents and distributors. N. A. Weston has been given charge of shovel division industrial sales in the Chicago sales district. G. H. Olson is general manager of the shovel and crane division.

Twin Coach Company Deliveries

Of a total of 88 units shipped from June 21 to July 20, the Twin Coach Company of Kent, Ohio, delivered 34 coaches to the Birmingham Electric Company, Birmingham, Ala., and 2 to Mill-Power Supply Company, of Charlotte, N. C. Other deliveries were made to Woodlawn and Southern Motor Coach Co., Aliquippa, Pa.; Central Illinois Electric & Gas Co., Rockford, Ill.; Valley Public Service Co., Columbus, Ohio; Campus Travel, Inc., New York City; Suburban Equipment Holding Co., Warrensville Heights, Ohio; Southern Pennsylvania Bus Co., Chester, Pa.; Utah Light & Traction Co., Salt Lake City, Utah, and New York State Railways, Rochester.

Vulcan Bearing Service Distributor

The Vulcan Bearing Service, Inc., Dallas, Tex., announces that the sale of VULCAN connecting rods and shock absorbers in the Southwest trade territory is now being handled by Bob McCord. Mr. McCord was formerly with the Wilkening Manufacturing Company, Philadelphia, Pa., for twelve years, gaining extensive information of the Southwest, and is peculiarly well fitted for service to the automotive distributor.

Illuminating Engineering Society Convention

The Thirtieth Annual Convention of the Illuminating Engineering Society will meet at the Statler Hotel, Buffalo, N. Y., August 31 to September 3. Leading authorities on illumination design, sight conservation and lighting practice are expected to attend and present papers of interest to industrial executives, engineers, architects, lighting specialists and others interested in better illumination of the home, office, industrial plant and outdoor locations. Latest developments in light sources, lighting equipment and lighting practices will be shown by exhibits of leading manufacturers.

TRADE LITERATURE

PERPETUAL INVENTORY CONTROL—
Folder—for simplifying inventory methods and providing a basis for reducing stores and carrying charges to a minimum.
The McCaskey Register Company, Alliance, Ohio.

TRUCKAIR AND STATIONARY COMPRESSORS—
Bulletin A-14—devoted to new compressor unit designed specifically for truck mounting with power take-off from the truck propeller shaft to utilize the truck engine for drive.
Bulletin A-13—devoted to a new stationary heavy duty air and gas compressor featuring Timken bearings, etc.
Sullivan Machinery Company, Michigan City, Ind.

BITUMINOUS HIGHWAY MAINTENANCE—
Folder—devoted to modern bituminous highway maintenance equipment.
Littleford Bros., Cincinnati, Ohio.

AMMONIA VALVES AND FITTINGS—
Catalog—devoted to ammonia valves and fittings, including many new items such as electric control valves, oil type liquid level indicators, diffusers, bolts and nuts, four kinds of gaskets, pipe hanger fittings, and repair parts for ammonia valves.
Frick Company, Waynesboro, Pa.

TRAVELING CRANE—
Catalog — illustrating and describing the Whiting Tiger Electric Traveling Crane.
Whiting Corporation, Harvey, Ill.

WESTINGHOUSE JUBILEE—
Booklet—editorial section of a recent edition of Iron Age presenting an unusually interesting word and picture "character study" of Westinghouse Electric & Manufacturing Company, now celebrating its Golden Jubilee.
Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.

FLOOR TRUCKS—
Circular No. 220—illustrating and describing easy-rolling floor trucks for factories and warehouses.
Lewis-Shepard Co., engineers for material-handling equipment, Watertown (Boston), Mass.

BUDA-LANOVA DIESEL ENGINE—
Bulletin—illustrating and describing the Buda-Lanova Diesel Engine—Model 6-LD-909—which employs an unusual type of cylinder head, producing "soft combustion," said to be attained through increased turbulence and controlled combustion.
The Buda Company, Harvey, Ill.

ALLEN HOLLOW SCREWS—
Booklet—illustrating and describing Allen hollow screws made of Chrome-Molybdenum Steel for increased strength.
The Allen Manufacturing Co., Hartford, Conn.

FRICK REFRIGERATION—
Bulletin—listing, theatres, hotels, restaurants, hospitals, stores, industrial plants and other buildings where Frick Refrigeration has been installed for air conditioning.
Frick Company, Waynesboro, Pa.

STEEL BARS AND SHAFTING—
Booklet—telling in pictures of the production in two great steel mills—at Buffalo, N. Y., and Harvey, Ill.—of cold finished steel bars and precision shafting.
Bliss & Laughlin, Inc., Harvey, Ill.

USES FOR RAYON—
Bulletin—"The New and Revolutionary Things Being Done in Rayon," a series of bulletins designed to present information on new products and new developments in products of the du Pont Company and affiliated companies.
E. I. du Pont de Nemours & Company, Wilmington, Del.

MEDIUM-PRESSURE ACETYLENE GENERATOR—
Folder—illustrating and describing the Carbic CMP-1 portable medium-pressure acetylene generator for use with all types of welding and cutting apparatus.
The Linde Air Products Company, New York City, unit of Union Carbide and Carbon Corporation.

LINK-BELT HEATING SYSTEM—
Folder No. 1518—illustrating and describing Link-Belt Heating System with radiostat control;
Folder—entitled "The Miracle of the Radiostat," by G. Wilson Thomas, electronic engineer.
Link-Belt Company, Chicago, Ill.

RECORDING THERMOMETERS—
Data Book No. 210—illustrating and describing the new Republic Thermometer, a gas-filled recording instrument which introduces several unusual features.
Republic Flow Meters Co., Chicago, Ill.

PROGRESS IN AIR CONDITIONING—
Booklet—illustrated, presenting a paper on "Progress in Air Conditioning in the Last Quarter Century," by Willis H. Carrier, chairman of the board of Carrier Engineering Corporation, before the semi-annual meeting of the American Society of Heating and Ventilating Engineers, at the joint session with the American Society of Refrigeration Engineers, June 23, Buck Hill Falls, Pa.
Carrier Engineering Corporation, Newark, N. J.

MODERN PAYROLL METHODS—
Folder—descriptive of payroll accounting plans for all types and all sizes of businesses and illustrated with representative forms for compiling information required by Social Security, Form 7067.
Burroughs Adding Machine Company, Detroit, Mich.

OVERHEAD TRACKS FOR HANDLING MATERIAL—
Catalog No. A-64—entitled "Overhead Track Systems Modernize Material Handling," illustrated, presenting some new items recently put on the market by Richards-Wilcox Manufacturing Company, including ball bearing switches, new type cranes, etc., the main item covered, however, being the Tru-Tred Track.
Richards-Wilcox Manufacturing Company, Aurora, Ill.

SHINGLES, SIDINGS, ROOFINGS—
Booklet—illustrated, devoted to Genasco shingles, sidings and roofings.
The Barber Asphalt Company, Philadelphia, Pa.

CONTROLLING BOILER WATER LEVEL—
Leaflet—illustrated, devoted to the control of boiler water level on rapidly fluctuating loads with the COPES Double Control Regulator, Form No. 401, presenting a paper by Dan Gutleben, Engineer, Pennsylvania Sugar Company.
Northern Equipment Co., Erie, Pa.

RESEARCH IN THE RAILROAD INDUSTRY

(*Continued from page* 31)

wheel flanges of passing locomotives caused pressure against the rail, a hardened steel ball was forced against a soft plate. The impressions so made upon the soft steel plate were carefully measured and the results charted. Thus, a graphic picture of the side swings of the locomotive wheels and the pressure exerted against the rails was obtained.

Streamlining

ACCURATELY stated, the purpose of streamlining—one of the most universal vogues—is to reduce atmospheric resistance to the motion of bodies or vehicles. It is economically justified in terms of its true function when speeds of 60 miles per hour or more are sustained for measurable distances or intervals of time.

Therefore, to apply the term streamlining to bathtubs, stoves or other objects that never move or are never moved at speeds approaching 60 miles per hour is a misuse of the word in its true sense. Much that goes for streamlining is merely styling or form and shape design. The railroad industry has a clear understanding of the purpose and advantage of streamlining. It has known the merits of it as applied to passenger and freight trains since the early '90's, long antedating its application to aeroplanes and motor vehicles.

Dr. Goss in the early '90's conducted wind tunnel tests at Purdue University, with models of freight and passenger cars. He then established some fundamental principles that are sound today and which have been verified by more recent wind tunnel tests.

In 1903 the Baltimore and Ohio made road tests of a streamlined train, a prototype of the streamlined train of today.

It is apparent, that the railroad industry was some thirty years ahead of all others in pursuing applied research with respect to streamlining. In the design of recent new equipment, additional wind tunnel tests were made. Upon the basis of the results of these tests and the work of Dr. Goss the designs were perfected.

Air-Conditioning

FORTY million dollars is no small sum even in these days, yet the railroad industry has spent that amount since 1932 for the air-conditioning of railroad passenger cars. In all probability, considerably more than $40,000,000 will be spent for applying air-conditioning to many additional cars.

To perfect the results being obtained and to obtain additional information upon which to base future designs, a very comprehensive research program on air-conditioning has been in progress since the first of the year. This work is being done under the auspices of the Association of American Railroads with the cooperation of the railroads and the manufacturers of air-conditioning equipment.

The objectives of this research program are:

1. Determination of the basic practices and policies which should be adopted with respect to the air conditioning of railroad passenger cars.
2. Determination of what system or systems are most suitable for railway service in terms of:
   (a) Capital investment
   (b) Cost of Maintenance and Operation, and
   (c) Satisfaction and well-being of passengers

Some of this work is in progress at the Mt. Clare Shops of the Baltimore and Ohio Railroad, some at the plant of the Pullman-Standard Car Manufacturing Co. in Chicago, and other work at Ohio State University, Columbus, Ohio. In addition, experience data are being secured from the railroads.

Thus, through applied research on a wide front the railroad industry is endeavoring to determine ways and means of improving upon the air-conditioning of its passenger cars in order that the traveling public may have additional comfort and pleasure.

Motive Power

THE steam locomotive has been a fascinating and useful source of railroad power for generations. There is something almost human about this mighty, speedy and puffing and wholly dependable power unit. The steam locomotive of today is very unlike its great-grandfather. In fact, the great-grandfather would have some difficulty in recognizing him, so extensive have been the changes.

No other vehicle used in any form of transportation has received as exhaustive, continuous and expensive scientific study as the steam locomotive. These studies have been conducted on the rails—the proving ground of the railroad industry—and in the locomotive laboratories of the Pennsylvania Railroad and Purdue and Illinois Universities. Extensive additional locomotive research programs are being formulated at the present time. Thus has the steam locomotive been evolved and thus will evolution continue.

Notwithstanding the merits of the steam locomotive, railroad managements and engineers have not been unmindful of the possibilities of other forms of power. Hence the electrification of the Pennsylvania, the Virginian, the Milwaukee and other railroads. Hence, also, the extended use of Diesel-electric locomotives in switching service and in some degree in passenger service. The railroads have invested many millions of dollars in Diesel-electric power during the last ten years.

On their rails the nation's carriers are determining the appropriate and economical place of this type of power in railroad operations. As a part of the study, the laboratories of the universities, manufacturers and railroads are busy with many phases of Diesel-electric design and performance. It may be anticipated that as a result of this intensive applied research the Diesel-electric locomotive of tomorrow will be in essential directions, unlike the one of today.

Future Projects

ALONG a number of fronts there are studies in process pertaining to steam turbine locomotives, welding and cutting, extending the use of the new and lighter alloys, plastics, paints, track stresses and the welding of track, caustic embrittlement of boiler steel and many of the other 60,000 to 70,000 commodities purchased and used by the railroad industry.

There is an alertness and aggressiveness in the industry relating to applied research, and all of this interest and activity is designed to give transportation service which will be adequate for the demands of a progressive civilization.

Textile Industry

Major Markets for Machinery and Supplies Graphically Presented Show Dominant Postion South Holds in Industry

A STUDY of the Textile Industry—Market Research Series No. 14.1 of the Basic Industrial Markets in the United States—has been released by the Wholesale Trade Section, Market Research Division of the Department of Commerce.

Primarily this study is intended to bring to manufacturers selling to the textile industry of the United States, accurate information on the location and density of the market offered by the various great branches of the textile manufacturing group. It offers a graphic picture of the textile industry as a whole and emphasizes the importance of the South in textile manufacturing, listing by industrial groups, by states and counties the types of machinery in each.

Under this classification, the South is shown to have 70 per cent of the 233,400,000 pounds per year rayon capacity of the country.

Of the combined textile manufacturing industry of the United States, the South in 1933 had 1115 establishments operating one or more individual plants. They paid out in wages $178,477,000, for materials and power, $436,104,000, and the value of their output was $785,784,000.

Principal equipment in Southern textile mills included 50,946 cards, 370,159 looms, 20,553,954 spindles, 3,891 braiders, 98,881 knitters, loopers and ribbers, and 12,923 sewing machines in textile plants.

In cotton manufacturing the South holds the premier position. The 1936 *Blue Book of Southern Progress* shows that with 64 per cent of the cotton spindles in place in all the mills of the United States, the South reported 75 per cent of the country's operating spindle hours in 1935.

Naval Stores

(*Continued from page 35*)

manufacture of high-grade soaps and ester gum. Some have advantages over ordinary rosin for use in varnish, and in sizing paper.

At present pine gum is converted into virtually but two commercial products —rosin and turpentine. But the gum has to be processed to obtain them. Under this new method it is believed that some of these new gum fractions may be used directly in making industrial products. As a result of these experiments we may be on the threshold of sweeping changes in the production and processing of naval stores. If this new process enables us to take from the gum that portion most suited for making soap or sizing paper, or other special new products without following the old route of first converting the gum into rosin and turpentine, it will be of considerable value both to producers and the industries of the country.

In addition to this experiment which now claims the attention of scientists, the naval stores division of the Bureau of Chemistry and Soils has, during the last few years, given the industry a permanent set of standards for grading rosin, accepted all over the world and estimated to be worth $150,000 a year to pine tree farmers of the South.

It has developed better barrel gluing, and introduced a practical dehydrator for turpentine; estimated to save the industry $250,000 a year.

It developed improved still settings and a fire still that heats evenly, draws well, and saves fuel; worth $200,000 a year to pine gum producers.

Developed method for improving quality of pine gum; estimated value to industry $150,000 a year.

Developed means for controlling turpentine distillation preventing losses to turpentine farmers estimated at $100,000 a year.

Introduced improved turpentine storage conditions reducing oxidation and eliminating discoloration; estimated value $100,000.

Developed a new type steam turpentine still with increased capacity and productivity, worth about $2,500 a year to each user.

Advised producers how to prevent rosin losses in chips which now range from $200,000 to $400,000 a year.

Proved that gum contaminated with iron rust from rusty equipment can lower the quality of rosin as much as 3 or 4 grades causing heavy loss to producers.

Proved that a thermometer on a still pays the producer in better grades of rosin which bring more money.

Developed reliable annual statistics on production, distribution, consumption, and carryover of naval stores, the intelligent use of which will enable producers and users to conduct their respective businesses on a sounder basis.

Finally, the station has, through cooperation with State organizations, made available to the producer, at his own still, the best practices in still operation. This helps him at once to lower the cost of production, reduce wastes, make better rosin, and save more turpentine.

The new method of facing protects the tree, the owner, and the lumber industry. Cup tilted to prevent breakage by freezing in winter

It is conservatively estimated that the new findings, some of which I have mentioned, will enable producers of naval stores to pocket about a million and a half dollars a year more than formerly. The amount will be larger still when all producers follow the newer practices experimentally worked out by the Bureau of Chemistry and Soils and the Forest Service.

More and Better Equipment

As a result of these newer methods, intelligent guidance by statistics on production, improvement in business, and a better balance between the supply of and demand for naval stores, there is an increasing interest in the whole naval stores program. Old equipment is being replaced by more efficient equipment. Producers are recognizing the value of replacing old rusty cups. There is an air of permanency developing which is calling for rebuilding, replacing and reworking. This, of course, is helping business generally.

The new still layouts, for example, call for lumber, brick, copper, and many other items that keep the wheels of industry turning. Incidentally manufacturers are spending considerable time and money trying to develop more durable and more satisfactory cups.

Briefly, there are perhaps a million people in all who participate directly and indirectly in the work and profits of producing naval stores.

Looking Ahead

The naval stores industry of the future will undoubtedly lean heavily upon chemical research and cooperation. After years of overproduction, depressed prices, and in many cases inefficient operation, the time is ripe for a general improvement in methods of production, for refinement, diversification and standardization in naval stores products. Indeed such changes are necessary.

In recent years scientists have given the industry methods for improving both the quality and the profit in naval stores. A tour of the country around the experiment station shows that these new methods are being used by producers within a radius of 50 or 75 miles of the station, and to a lesser degree further away where they are not so well known.

The Nation's Powerhouse

(*Continued from page 29*)

rate advantages to all the large consuming markets.

The four Northern states — Pennsylvania, Ohio, Indiana and Illinois—are all large consumers of coal, while the four Southern states of West Virginia, Kentucky, Tennessee and Virginia consume a small percentage of their production. The Northern states ship 30 per cent of their production to other states, to the Great Lakes and to tidewater for redistribution. The Southern states in this competing area ship 75 per cent of their production to other states, including shipments to the Lakes and tidewater. In the Northern districts 32 per cent of the production is shipped to intrastate points, while in the Southern area only 6.5 per cent is shipped in intrastate commerce.

For many years labor differentials favored the Southern districts. The labor wage necessarily was lower in the South to enable the Southern mines to market their product with the higher freight rates prevailing. The wage disparity between the two sections, however, has been narrowed with the advent of the NRA which brought about unionization of the coal mines in the North and South. While the rate of wages is now constructed to give the Southern operators an advantage of 10c per ton, the average freight rate differential gives the Northern operator an advantage of 50c per ton. Even under the prevailing wage rates, the Southern miner has a greater income than the Northern miner because of physical conditions that enable him to produce more coal. The question of wage differentials between the

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The Nation's Powerhouse

(*Continued from page* 62)

competitive states in the Appalachian area is under consideration by groups of operators and miners.

Since the world war technological advances in the science of combustion and utilization of coal, as well as other fuels, have materially reduced the consumption of coal. Railroads, electric public utilities, iron and steel plants and many lines of manufacturing have effected economies reducing consumption from 15 to 55 per cent.

Lost Markets

In the South during the last ten years, the more general use of water power has displaced 5,000,000 tons of coal annually. In 1926, there was generated in the Southern states 4,062,000,000 kilowatt hours of hydro-electric energy, and 8,825,000,000 kilowatt hours by fuel. Ten years later, in 1935, the South produced 10,865,000,000 kilowatt hours by water power, and 11,264,000,000 kilowatt hours by fuel. This development of water power cost the coal industry more than 5,000,000 tons of coal in 1935. In this decade there was rapid development of hydro-electric energy in Alabama, Georgia, Maryland, the two Carolinas and Tennessee.

It is one of the many paradoxical acts of the present Federal Administration that by adherence to and expansion of its power program it has accentuated the shift of energy from bituminous coal to the laborless substitute—water power. At the end of 1932, about 200,000 miners in the nation were idle. Thousands became beneficiaries of Federal relief. To keep them permanently unemployed, it may be assumed, the Government began the expenditure of untold millions for TVA and many similar projects to create another form of energy to displace coal. Then it turned to support the Guffey bill to stabilize wages and increase the price of coal to make it increasingly difficult for coal producers to compete in the markets with the laborless energy the Government had created at these mammoth dams.

From the efforts employed by the leaders of mine labor, it is evident that they have not realized that legislation, even designed in good faith to stabilize wages and prices, will not insure employment. Consumers can not be compelled by statute to purchase coal if cheaper satisfactory substitutes are available. Neither can they be restrained from the exercise of their ingenuity in effecting economies in combustion.

Mechanization Under Way

To overcome high wages, Northern mines have turned to mechanical loading in recent years. In 1934, 52.6 per cent of the production in Illinois was mechanically loaded. In Indiana, 61.4 per cent; Ohio, 5.8 per cent, and Pennsylvania, 7.3 per cent. In the South, Alabama was first with 11.8 per cent of the production mechanically loaded. In Kentucky only 743,000 tons were loaded mechanically last year, and in West Virginia only 1,364,000 tons, or 1.4 per cent of the latter's production.

There is, however, an unmistakable drift toward mechanization in Northern and Southern mines during the current year. Coal producers are going to meet the threatened loss of markets to substitutes by lowering production costs, if possible, by the more extensive use of machinery, even if it curtails employment. The Government, they point out, had no scruples against decreasing employment when it launched its TVA power program.

In fact, the FERA, in a survey of the bituminous coal industry and competing fuels, issued in December, 1935, recognizes this competitive condition and says:

"Mechanization for the coal industry is a necessity in order to meet the severe competition from other sources of energy."

Southern coal producers are able and virile men, practical and experienced in production, students of marketing conditions. They are always first to modernize their mines and to serve the markets with grades of prepared coal to satisfy the demands of consumers. With few exceptions they have never developed the habit of demanding from their Government artificial stimulation to revive the industry when economic ills appear. Chastened in the crucible of the depression, deploring the expenditure of Government funds to encourage the development of substitute power and fuel, successfully resisting the Government control of their own industry, the coal producers of the South, unshackled and unwearied, are confident that the coal industry can prove that it is not a decadent industry. They stand over 547,000,000,000 tons of the purest and highest quality coal discovered by mankind and proclaim their ability to mine and market this great reserve of power.

Liquefied Petroleum Gas Industry

(*Continued from page* 33)

liquid propane be constructed in accordance with the A. S. M. E. code for the construction of unfired pressure vessels, or the joint A. P. I.-A. S. M. E. code for unfired vessels for petroleum products, for a working pressure of 200 pounds per square inch. Storage tanks constructed by the fusion welding process are preferred.

Propane Gas Service for Small Cities

Development of liquefied gas plants and distribution systems for serving small cities has made progress in the last few years.

Liquefied petroleum gases are used extensively by the gas industry—in serving small towns with butane-air gas, propane-air gas, undiluted butane or undiluted propane; for standby purposes in natural or mixed gas distribution; for peak load production and for enrichment of water gas.

A recent survey shows that there are a large number of communities, over 2000 population, without gas service. The total amount of gas required for any of these communities is small, the load factor is likely to be extremely low, and serving them through gas transmission lines is not usually economical because of high fixed charges on the necessary pipe lines. Liquefied petroleum gases in many instances furnish the solution of the problem of serving such communities.

Plant Equipment for Small Municipal Service

One of the advantages of an undiluted propane plant is the simplicity and low cost of the equipment required. It consists of the following:

Plant site and railroad siding
Unloading pump
200 Pound W. P. propane storage tank and accessories
Two stages of gas regulation
Station meter
Shelter for pump, second stage regulator and meter

A pump commonly used is of the motor driven rotary type, specially designed for handling light hydrocarbon liquids such as propane. It requires a 3 horsepower motor of the type suitable for Class 1 Group D locations and will unload a tank car of propane in four to six hours.

Storage tanks constructed for 200 pound working pressure in accordance with the A. S. M. E. code or the joint A. P. I.-A. S. M. E. code are required. Tank of 15,000 to 30,000 gallon total capacity may be used depending on size of the town and the load factor.

Several propane gas plants have erected small buildings to house the unloading pump, second stage regulators and station meters while others use only a sheet iron shelter. A suitable shelter is undoubtedly cheaper and entirely satisfactory but if a building is desired, a floor space 8 x 10 feet should be provided. A small plant site approximately 150 feet square is in most cases sufficient.

Estimated Costs for Plant Supplying 500 Meters

Plant site	$500
Railroad siding	1,500
Fence	600
Shelter	75
15,000 gallon storage tank, pump, regulators, meter, valves and piping	4,000
Construction, etc.	500
Total	$7,175

With 150 to 200 meters installed, the plant cost per meter is approximately $50 to $35, 500 customers about $15 per meter and 750 customers about $10 per meter.

Distribution system costs are difficult to determine except after detailed survey. It is estimated from previous construction costs that an average of $75 per meter is required, frequently running higher depending on soil or topographic conditions. This cost includes mains, service lines, house regulators and meters and construction labor.

Typical Southern Installations

Typical of the installations of municipal liquefied gas plants and distributing systems is one located at Andalusia, Ala., which has a population of 5,200. This plant has a capacity of 6,000 cubic feet per hour. It consists of a small brick building housing the mixing apparatus, controls and compressor, and two welded storage tanks — one for butane liquid which is received in tank cars and one for gas. The tanks were furnished by the Chicago Bridge & Iron Works.

(*Continued on page* 66)

Liquefied Petroleum Gas Industry

(*Continued from page* 64)

The plant is entirely automatic in operation. Gas is mixed and pumped directly into the distribution system by compressors which start when the pressure in the mains drops to 4 pounds per square inch and stops when the pressure increases to 10 pounds. A reserve supply of 18,000 cubic feet is held in the gas tank at 75 pounds per square inch pressure and feeds into the distribution system if the pressure continues to drop after the compressors start.

The distribution system contains 11 miles of cast iron mains ranging from 2 to 6 inches in diameter. Each service is provided with a regulator which reduces the gas pressure to about ¼ pound per square inch at the appliances.

The Andalusia plant was designed by Charles A. McKeand and Associates, and equipment installed by Algernon Blair, Montgomery, Ala.

At Troy, Ala., which has a population of 7,000, a butane gas distribution system, similar in size and design, is in operation. Christie, Hutchinson & Burton Company, Birmingham, were the general contractors, and the tanks were supplied by the Chicago Bridge & Iron Works. The Troy butane-air gas plant has a normal operating pressure of 8 pounds with provision for a maximum of 80 pounds, full automatic control. The distribution system is composed entirely of cast iron pipe, comprising 2,500 feet of 4-inch, 4,100 feet of 3-inch and 48,000 feet of 2-inch—all equipped with mechanical joints employing Thiokol-duck-tipped rubber gaskets. The 4-inch and 3-inch pipe were furnished in 16-foot lengths; the 2-inch pipe was cast in 5-foot lengths and furnished in 20-foot sections assembled at the foundry with tapped and threaded intermediate joints. R. J. Reid Contracting Co., Birmingham, Ala., had the contract for installing the distribution system.

In addition to these and other butane gas plants, recent Southern projects include the following:

Ala., Union Springs—J. B. McCrary Co., Atlanta, Ga., has contract at $44,000 for city butane gas plant and erection of storage tank, laying mains, and pipes; R. L. Kenan & Associates, Montgomery, Ala., consulting engineers.

Ala., Brewton—J. B. McCrary Co., Atlanta, low bidder on butane gas plant and distribution system of approximately 53,000 feet of service pipe; R. L. Kenan & Associates, Montgomery, Ala., consulting engineers.

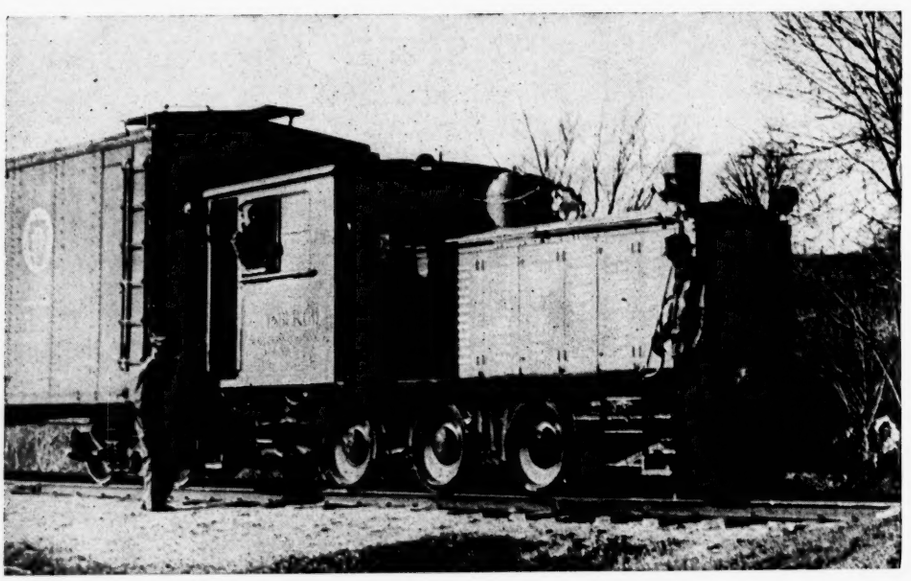
Ala., Ozark—R. D. Cole Manufacturing Co., Newnan, Ga., has contract for tanks for butane air-gas plant and distribution system of approximately 53,000 feet of service pipe; Algernon Blair, Montgomery, Ala., general contractor.

Ala., Alexander City—Proposed establishment of butane gas plant and distribution system of about 100,000 feet of service pipe; R. L. Kenan & Associates, consulting engineers.

Tenn., McMinville—Austin Gatlin is the general contractor for the butane gas plant system for McMinville Gas Co.

Fla., Sebring — Paul Smith Construction Co., Haines City, Fla., has contract for butane gas plant.

Tex., Marfa—B. & M. Construction Corporation, Oklahoma City, Okla., has contract for constructing butane gas plant; P. McDonald Biddison, Dallas, Tex., consulting engineer.



30 ton direct drive Butane locomotive. Pittsburgh Plate Glass Co.

Growing Use of Cast Iron Pipe in Service Mains

Within the past year or more, butane gas plant installations have indicated a marked trend toward the use of cast iron pipe. Since cast iron is generally recognized by engineers to have superior corrosion resisting qualities, this material has been used recently in two Alabama butane systems—the one at Troy and the other at Andalusia. In both cases, the cast iron pipe is said to be giving complete satisfaction. It has been used in Tennessee and other Southern states. It is understood that cast iron pipe is to be used in the butane systems to be installed at Ozark, Brewton, and Union Springs, all in Alabama.

As butane distribution systems usually are for comparatively small towns, small diameter pipe is needed. The development in the past few years of small diameter cast iron pipe with threaded joints has made cast iron available for this type of construction. The joints are oversize affording bottle tight construction. Cast iron pipe is now being regularly made and used in these butane distribution systems in diameters of 1¼ inches, 1½ inches, 3 inches and, of course, the standard 4-inch sizes and up.

Certified Houses

ONE of many plans now being discussed for creating an agency to register and certify the materials used in new buildings, is suggested by G. P. MacNichol, Jr., vice president in charge of sales of Libbey-Owens-Ford Glass Co., Toledo, Ohio. These plans, although differing widely in text, are primarily designed to make possible the building and sale of "certified houses."

The purposes of the MacNichol plan are briefly outlined as follows:

1. To give home builders and purchasers a permanent record of materials actually used in the construction of a house.
2. To assure actual use of materials specified.
3. To give lending institutions something tangible on which to base valuation of properties.
4. To give real estate operators an instrument to evidence quality of a home offered for sale.

This method of certifying construction, under Mr. MacNichol's plans, calls for the cooperation of the Producers' Council—national organization of manufacturers of building supplies and equipment, the American Institute of Architects, and manufacturers of building materials and equipment.

The suggested responsibilities of the interested groups are set forth as follows:

I—Producers' Council.

(a) Will provide forms and machinery for the operation of the plan.

(b) Will promote the use of the plan by architects through advertising and publicity.

(c) Will provide for recording of certificate which is to be made out in triplicate, one copy going to the owner, one copy to the Producers' Council, and one copy retained by the architect.

(d) Will furnish plaque on receipt of certificate for registration.

(It might be well to consider classifying homes according to specification, although this might involve some difficulties.)

II—The American Institute of Architects.

(a) Should indorse the plan or at least approve it.

(b) Aid in promotion of the use of the plan by its members.

(c) Cooperate with Producers' Council in determining proper form of certificate and list of specifications to be included.

(d) While it may not be practical at first, the group should see to enforcement of the plan through its local chapters.

III—Manufacturers.

(a) Contribute to Producers' Council for promotional funds.

(b) Publicize the plan and promote its use in the advertisements of individual companies.

(c) Promote the plan through their sales organizations.

(d) Aid in enforcing the plan through checking the use of their own products when specified.

IV—Architects.

(a) Architects should immediately adopt the plan and furnish the builder with a notarized certificate stating that materials were furnished as specified.

(b) Should supervise job to insure that contractor follows specifications.

(c) Should send one copy of certificate to Producers' Council for registration.

The plan would be promoted through a vigorous advertising and publicity campaign, after a sufficient number of architects are "sold on the plan" and had adopted it.

HITTING THE MARK

Many shoot, but few are shots. It is one thing to pump ten slugs in the outer ring—another to group them within a 2" radius of the bulls-eye. Each year many pumps are made and sold that hit the bulls-eye of superlative performance. Other pumps are made and sold—still others are just made. Check up on all pumps and you won't need to guess what pump is hitting the bulls-eye of users satisfaction. You will find it is Pomona. Correctly engineered, constructed of the best materials, machined by skilled artisans, sold and serviced by men rich in a background of pumping experience. That's Pomona.

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World Power Conference

THE Third World Power Conference to be held in Washington, September 7 to 12, will be of particular interest to the South. This section, now the country's greatest primary source of energy producing fuels, has been a leader in hydro-electric development.

The Southern States, which produced 10,865,000,000 kilowatt-hours of hydro-electric energy in 1935, have nearly 32 per cent of the installed water power of the United States, which will be increased with the completion of several major projects now under construction.

The South supplied 172,628,000 tons, or nearly 47 per cent, of the bituminous coal mined in this country in 1935. It has a coal area double that of Europe, including Russia.

With production in excess of 646,000,000 barrels of petroleum in 1935, the South is supplying 65 per cent of the domestic output and 42 per cent of the world's petroleum production.

The South produces over 1,241,000,000,000 cubic feet of natural gas, or about 70 per cent of the country's output.

The estimated 8,950,000,000 barrels of oil reserves out of a possible national reserve of 13,000,000,000 barrels, and continued discovery and development of new fields and improved methods of extraction and refining, assure an adequate supply for many years to come.

Power and allied interests are preparing their programs for the World Power Conference.

President Axtell J. Byles of the American Petroleum Institute has appointed J. Edgar Pew, of Philadelphia, and Edwin S. Hall, of New York, as Institute delegates to the conference. Topics to be presented will concern the general subject of production and distribution of petroleum and its products. The history and status of petroleum refining will be reviewed by J. Noel Robinson, of the Tidewater Oil Co., New York. Production control will be discussed by R. E. Hardwick, of Fort Worth, Texas.

All phases of the power question will be covered at the Third World Power Conference, including flood control and land conservation in connection with hydro-electric development, as well as general engineering problems relating to power.

Phosphate Rock Shipments Highest Since 1930

BOTH mine production and sales of phosphate rock in the United States advanced in 1935. The continued revival of this industry is of especial importance to the South which supplied practically 98 per cent of the country's output. The marketed production of 3,042,381 tons in 1935 was the largest since 1930 and sustained the steady gain since 1932.

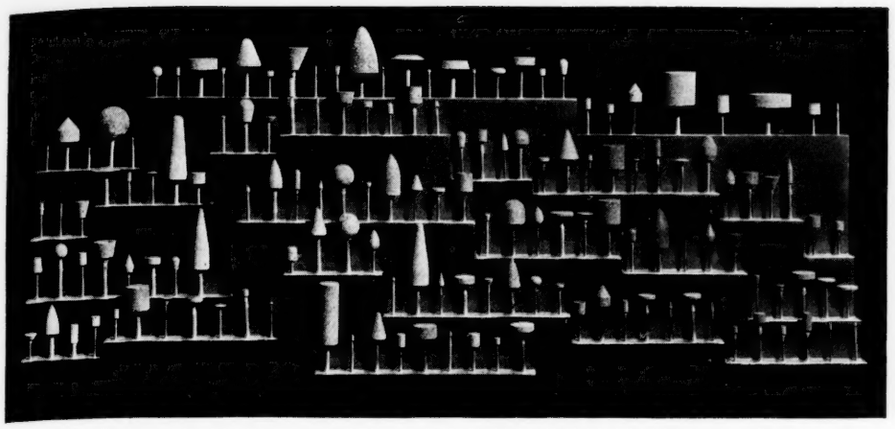
Production totaled 3,215,586 tons, an increase of 11 per cent over 1934. With increased shipments in nearly every producing state, total sales amounted to 3,042,381 long tons valued at $10,935,672, a gain of 7 per cent in quantity and 9 per cent in value compared with 1934. Exports of phosphate rock, 1,104,394 tons, were 11 per cent greater than in 1934. An increase in Florida stocks resulted in an increase in total producers' stocks from 1,044,045 tons to 1,169,047 tons. Florida produces over 82 per cent of the domestic phosphate mined.

General Electric Orders Increase 40 Per Cent

Orders booked by the General Electric Company, Schenectady, N. Y., for the second quarter of 1936 amounted to $77,398,718, according to President Gerard Swope. This compares with $55,163,014 for the corresponding quarter in 1935, an increase of 40 per cent. Orders booked in the first quarter of 1936 showed an increase of 21 per cent, as compared with the first quarter of 1935. The second quarter of 1936 was the best since the second quarter of 1931. For the six-month period of 1936, orders amounted to $136,968,597, compared with $104,542,946 for the first two quarters of 1935.

Phosphate Rock Production and Shipments, by States

	Production	Shipments		
Florida	Tons	Tons	Value	Value Per Ton
Hard rock	121,597	116,483	$500,526	$4.30
Land pebble	2,493,463	2,269,891	7,735,903	3.41
Soft rock	39,535	36,430	125,129	3.43
	2,654,595	2,422,804	$8,361,558	$3.45
Tennessee	493,501	550,284	$2,323,536	$4.20
Idaho and Montana	67,490	69,293	250,578	3.62
Total	3,215,586	3,042,381	$10,935,672	$3.59



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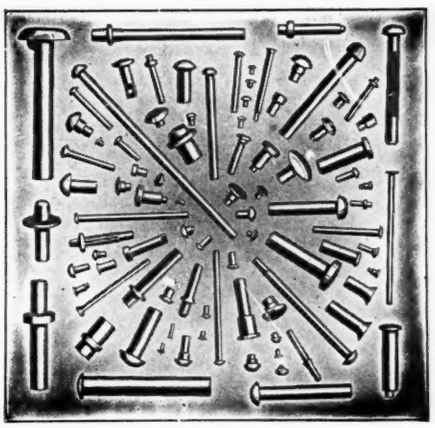

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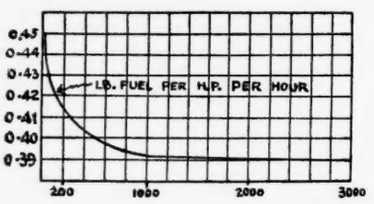
Diesel Fuel Consumption

"IF we should install a Diesel engine how much fuel would it consume?" is the question often asked by men who are considering the use of a Diesel for power purposes. In an effort to answer the question W. F. Schaphorst, M.E., Newark, N. J., gathered data on fuel consumption by modern Diesels of numerous sizes and has developed the accompanying curve. This curve tells at a glance what Diesels are doing today, the horse power varying from the smallest sizes up to and including 3000 h.p.



If requirements are very small—50 h.p. or even less—based on Mr. Schaphorst's scale—you can figure on a fuel consumption of 0.45 lb. per h.p. per hour with a modern engine. If you need a 100 h.p. Diesel the consumption will be about 0.42 lb. per h.p. hour. The curve shows that with increase in engine size the fuel consumption improves rapidly from the smallest sizes to 200 h.p. From 200 to 1000 h.p. the improvement is less rapid. And from 1000 to 3000 h.p. the improvement is very slight being practically 0.39 lb. per h.p. per hour for all of the sizes in that range.

To determine the efficiency of any engine size, with any fuel, multiply the b.t.u. value per pound by the number of pounds per h.p. per hour and divide the product *into* 2546.

If the fuel contains 20,000 b.t.u. per pound and you will require a 500 h.p. engine, the chart shows that you must multiply 20,000 by 0.40, which gives 8,000 as the product. Now divide 2546 by 8000 and it will be found that the engine will have an efficiency of 31.8 per cent, which is a high efficiency as compared with most engines of other types. It means that 31.8 per cent of the heat contained in the fuel will be converted into work. Even at 0.45 lb. of fuel per h.p. per hour, other conditions being the same, the efficiency will be 28.3 per cent which is a *high* efficiency.

Modern Glass Making the Product of Research

RECOUNTING the early discovery of glass and the long, laborious development of glass making over the centuries, the Pittsburgh Plate Glass Co., emphasizes in a special bulletin "Research," the part that science has taken in the phenomenal advance of the present day glass industry.

The past 20 years witnessed great strides in the evolution of glass making procedure, points out H. S. Wherrett, President of the Company, in citing some of the developments of his organization.

The old cumbersome manner of grinding and polishing has been supplanted by the modern continuous grinding and polishing method. The Pennvernon Process now draws window glass straight up into the air in a flat sheet which results in a window glass of a quality undreamed of 15 years ago; Duplate Safety Glass, Herculite Tempered Plate Glass, Solex Heat-Absorbing Plate Glass, all of these and many more have been developed within the past few years.

This rapid progress is not peculiar to the glass industry, reminds Mr. Wherrett, practically every branch of manufacturing has contributed to a like development of its products. Contrasted with the slow progress of past centuries, scientific research is the underlying reason for the rapid advance of the present.

Realizing the importance of research, the Pittsburgh Plate Glass Co. some years ago established adequate laboratories and has maintained the Control Laboratories for plate glass at the Ford City, Pa., Creighton, Pa., and Crystal City, Mo., plants. Similar laboratories have been operated in the three Pennvernon window glass factories at Henryetta, Okla., Clarksburg, W. Va., and Mt. Vernon, Ohio.

Commercial Cotton Crop

WORLD consumption of American cotton for the year ended July 31 was 13,359,000 bales, including 954,000 bales of linters, according to the annual report of the New Orleans Cotton Exchange.

Commercial consumption of cotton in the South was 5,587,000 bales, including 334,000 bales of linters.

World carry-over of American cotton is 6,995,000 bales, including 263,000 bales of linters. Lint cotton carry-over in the United States is 5,013,000 bales, of which 3,216,000 bales are in the hands of the Government.

Exports amounted to 6,257,000 bales.

RESALE DEPARTMENT

MACHINERY EQUIPMENT SUPPLIES

Gregory Hi-Grade Rebuilt Motor & Machinery Bargains

MOTORS ALL STANDARD MAKES & SIZES AC & DC

Also— Generators
Motor-Generator Sets
Air Compressors
Arc Welders
Oil Cooled Transformers

2200 v. prl. KVA	Make		110/220 v. sec. KVA	Make	
5	Westghse	S	37½	Gen. Elec.	H
10	Gen. Elec.	A	37½	Westghse	N
20	Moloney	HE	40	Gen. Elec.	H
25	Gen. Elec.	H	50	Gen. Elec.	H
25	Westghse	N	75	Gen. Elec.	H
25	Moloney	HE	100	Gen. Elec.	H
30	Gen. Elec.	H	100	Westghse	S

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GREGORY ELECTRIC CO.

1600 So. Lincoln St. Chicago

MOTORS
3 PH. 60 Cy.

HP.	TYPE	SPEED
600	G.E. Sl. Rg.	720
600	G.E. Sl. Rg.	252
600	G.E. Synch.	257
400	WEST. Sl. Rg.	505
400	G.E. Sl. Rg.	885
300	G.E. Sl. Rg.	575
300	AL. CH. Sl. Rg.	585
2-200	WEST. Sl. Rg.	900
200	G.E. Sl. Rg.	900
150	G.E. Sl. Rg.	870
150	G.E. Sl. Rg.	1750
100	G.E. Sl. Rg.	700
100	AL. CH. Sl. Rg.	695
100	WEST. Sl. Rg.	1160
90	G.E. Sl. Rg.	720
75	G.E. Sl. Rg.	1200

ENGINE GENER.

1—400 KVA. CR. WH. 240 V. 3 Ph., 60 Cy., 120 R.P.M. to Hamilton Corliss Engine.

MOTOR GENER.

1—1000 K.W. G.E. MPC 275 V. D.C. Gen. Conn. to 1440 H.P. G.E. ATI 4600/2300 V. 514 R.P.M. 3 Ph. 60 Cy.

1—300 K.W. WEST. 600 V. D.C. Gen. Conn. to 433 H.P. Syne. motor 4600/2300 V. 3 Ph. 60 cy. 1200 R.P.M.

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A. C. UNITS

KVA	Make	Location
750	G. E.—Ames Uniflow	N. Y.
375	C. W.—Ames Vertical Uniflow	Conn.
350	Wghse.—Hamilton Corliss	N. Y.
312	Al. Chal.—Erie Ball 4 v.	Mich.
312	C. W.—Ames Uniflow	Conn.
250	G. E. Turbine Unit (NEW)	N. Y.
150	Wghse.—Erie Ball 4 v.	Texas
150	G. E.—Ames Uniflow	Ga.
125	G. E.—Turbine Unit	Mich.
120	G. E.—Ames Uniflow	Ga.
100	G. E.—Erie Ball 4 v.	Ga.

ENGINE (Belted): 17 x 18 Skinner Uniflow—Pa.

BOILER: 300 H.P. B.&W., 200 lbs. (NEW)—N.Y.

Direct Current: 200 KW G. E. 250 v. (3 wire)—E. B. 4 v.—N. Y.

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220/440 V., 60 Cy., 3 Phase

(1)	250—C. Wheeler	Sq. Cage	1800
(1)	200—G. E.	Sq. Cage	1800
(1)	150—G. E.	Sq. Cage	1800
(1)	150—WEM CS	Sq. Cage	1200
(1)	100—WEM CS	Sq. Cage	1800
(1)	100—WEM CS	Sq. Cage	1200
(1)	75—Allis		1800
(2)	75—G. E. K.T.		1200
(1)	60—G. E. K. T.		1800
(1)	50—G. E. K. T.		1800
(2)	50—WEM CS		1800
(6)	50—G. E. K. T.		900
(1)	50—G. E. K. T.		1200
(2)	40—WEM CS		1800
(3)	40—G. E. K. T.		680
(4)	40—G. E.		600
(1)	75—WEM CS		900

Also, about 1000 other ratings, from ¼ H. P. up.

2—Ridgway Synchronous MG sets, 150 KW, 275 V. DC, 2300/60/3 AC with AC and DC panels.

MOTORS
2200 V., 60 Cy., 3 Phase

(1)	300—Allis	Sq. Cage	900
(3)	200—WEM CS	Sq. Cage	1800
(1)	200—Allis	Sq. Cage	1800
(2)	300—G. E.	Sq. Cage	1200
(2)	100—WEM CS	Sq. Cage	1200
(2)	75—G. E. M.T.	Slip ring	600
(3)	50—G. E. M. T.	Slip ring	600
(1)	50—G. E. M. T.	Slip ring	900
(1)	75—G. E. M. T.	Slip ring	900
(1)	125—Allis	Slip ring	435

220/440 V., 60 Cy., 3 Phase

(1)	200—WEM CW	500
(2)	250—WEM CW	680
(1)	150—WEM CW	585

3 bearing with chain drive

(1)	100—G. E. M. T.	900
(1)	75—G. E. M.T.	720
(1)	75—WEM CW	900
(1)	75—G. E. M. T.	900
(1)	75—G. E. I. T. C.	900
(1)	75—WEM CI	870
(2)	60—G. E. M. T. C.	900
(1)	50—G. E.	900

Westinghouse Type SK Motors, 230 Volts.

90—3	H.P.	1150 R.P.M.
42—3	H.P.	1750 R.P.M.
47—3½	H.P.	850 R.P.M.
162—5	H.P.	850 R.P.M.
76—5	H.P.	1150 R.P.M.
31—5	H.P.	1750 R.P.M.
17—5	H.P.	3450 R.P.M.
28—7½	H.P.	1750 R.P.M.
78—7½	H.P.	1150 R.P.M.
65—7½	H.P.	850 R.P.M.
1—10	H.P.	375 R.P.M.
2—10	H.P.	300/1200 R.P.M.
2—10	H.P.	600 R.P.M.
35—10	H.P.	850 R.P.M.
41—10	H.P.	1150 R.P.M.
34—15	H.P.	1750 R.P.M.
17—15	H.P.	1150 R.P.M.
11—15	H.P.	1750 R.P.M.
9—20	H.P.	850 R.P.M.
46—20	H.P.	1150 R.P.M.
21—20	H.P.	1750 R.P.M.
6—25	H.P.	1150 R.P.M.
4—25	H.P.	850 R.P.M.
1—30	H.P.	1750 R.P.M.
2—30	H.P.	1150 R.P.M.
1—30	H.P.	975 R.P.M.
1—30	H.P.	775 R.P.M.
2—30	H.P.	850 R.P.M.
14—40	H.P.	775 R.P.M.
2—40	H.P.	1750 R.P.M.
3—40	H.P.	1150 R.P.M.
2—50	H.P.	680 R.P.M.
2—50	H.P.	225/350 R.P.M.
3—50	H.P.	1150 R.P.M.
5—60	H.P.	680 R.P.M.
4—75	H.P.	1150 R.P.M.
3—100	H.P.	1150 R.P.M.

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60 Cy. 1 ph. oil cooled

3—500 KVA G. E., 23000/2300/4000.
3—300 KVA Pitts, 2300/230/460.
3—300 KVA G. E., 6600/13200/2300/4000.
3—150 KVA WEM, 2300/230/460/115.
3—250 KVA G. E., 2300/6600/230/460.
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3— 75 KVA G. E., 11000/2300—new.
9— 50 KVA Packard, 2300/230/460.
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2— 50 KVA WEM, 2200/4400/230/460.
2— 37½ KVA G. E., 2200/4000/122/244.
3— 25 KVA G. E., 2300/230/460.
3— 25 KVA Pittsburgh, 2300/115/230.
3— 25 KVA WEM, 2300/115/230.
1— 25 KVA WEM, 440/110/220.
2—125 KVA Pittsburgh, 2300/230/460.
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4— 10 KVA Wagner, 2300/230/460.
Also many other ratings.

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24" Bullard, vertical, side head.
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24" x 10' Greaves Klusman, heavy, belt dr.
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30" x 30' Harrington, plain chg. belt dr.
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SPECIAL

2—Vilter vertical twin cylinder REFRIGERATING MACHINES, complete with motor, ammonia receivers, oil separators, condenser, piping, valves, gauges and all accessories. Set up as operated. Excellent condition. Located at plant of former.

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80 H.P. ERIE, ASME code, 100 lbs. with stack.

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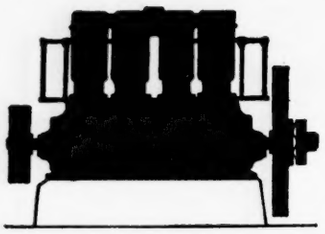

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Building—one story frame structure. High-ceiling.
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Sprinklered throughout.
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300 HP Heine ASME W. T. Boiler.
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90 HP, 120 HP, 140 HP and 360 HP Diesel Eng.
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Models 25 and 49 Kennedy Reduction Crushers.
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200 H.P., 3p., 60c., 440v., 690 RPM motor.

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Jaw Crushers—2″ x 6″ up to 66″ x 84″.
Crushing Rolls—12″ x 12″ up to 54″ x 24″.
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One Diesel electric dragline, 115′ boom, 5 yd. bucket.
3—8′ x 72″ Hardinge Mills.
New Dryers built for all purposes. Asphalt plants.
Shovels—Cranes—Air Compressors, Motors.

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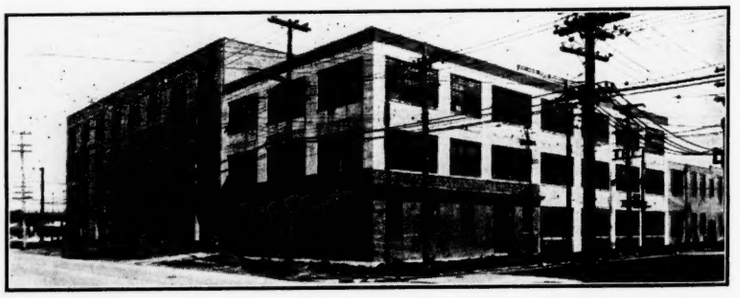

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L. U. NOLAND, Owner **Newport News, Va.**

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The following used, planing mill woodworking machinery, electrically driven with motors attached:

1—High Speed Matcher 15" with profiler
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1—Small two side Planer that will dress short stock and also dress wide boards.
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Give complete description and size of motors and location of machinery, and on the Moulder and Matchers state whether the motor is one motor or if there are several motors attached to each spindle.

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Also—One modern, up to date Dry Kiln with approximately 60,000' capacity. State condition, where located and what guarantees will be given.

Schwing Lumber & Shingle Co., Inc.
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2,000 ft.—9" x 8" Blaw Knox Road Forms.
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4-5 Ton WESTINGHOUSE TROLLEY CONSTRUCTION TYPES, DUPLICATES, 250 V. 36" track gauge. Practically brand new. Guaranteed to be used less than ten months since being shipped from Westinghouse.
Many other locomotives all weights, gauges and types. Send for List.

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60 HP F-M type Y Vertical Oil Engine 257 RPM, shaft extension, cold starting.
15 HP GE 3 ph. 60 cy. 220 V 1200 RPM Slip Ring Motor, complete.
9x8 1-R, type ER1 Air Compressor.
40 HP Kewanee Smokeless type Boiler with Stoker.
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Carbon Black Output Near Record In 1935

352,749,000 Pounds Produced Almost Wholly in Three Southern States

CARBON black production, practically all of which is in Texas, Louisiana and Oklahoma, amounted to 352,749,000 pounds in 1935, almost reaching the high output of 1929 and 1930. Demand was at a new peak last year with stocks in the plants being materially reduced.

Of 54 established plants, 21 producing companies reported a consumption of 241,589,000,000 cubic feet of natural gas which yielded an average of 1.46 pounds of carbon black per 1000 cubic feet of gas, according to the summary issued by the Bureau of Mines. The amount of natural gas used was equivalent to about 13 per cent of the total gas consumption during the year.

Production in the Texas Panhandle rose to a new high of 263,361,000 pounds, an increase of 11 per cent over 1934. Two new plants were operated in the Panhandle during 1935. The production of carbon black outside of the Texas Panhandle decreased slightly in 1935. The output in Louisiana declined from 66,538,000 pounds in 1934 to 64,875,000 pounds in 1935, probably due to curtailment in available supplies of natural gas because of increased pipe-line requirements.

CARBON BLACK PRODUCTION

	1934 pounds	1935 pounds
Louisiana	66,538,000	64,875,000
Texas*	262,290,000	287,874,000
Total	328,828,000	352,749,000

*Texas' total includes Oklahoma and Wyoming.

Sales of carbon black by manufacturers to brokers and consumers in 1935 totaled 387,536,000 pounds, of which 245,351,000 pounds (63 per cent) was consigned to domestic buyers and 142,185,000 pounds exported. Of the domestic deliveries, 213,708,000 pounds (87 per cent) was consigned to rubber companies, 15,177,000 pounds to ink companies, 6,550,000 pounds to paint and varnish companies, and 9,916,000 pounds to companies making miscellaneous products. Sales to rubber and miscellaneous uses increased in 1935, indicating a gain of 10 per cent in consumption of rubber.

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